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RESEARCH, EDUCATION, AND ECONOMICS (REE)

LONG-RANGE INFORMATION RESOURCES MANAGEMENT PLAN

Fiscal Years 1997 - 2001

Prepared by

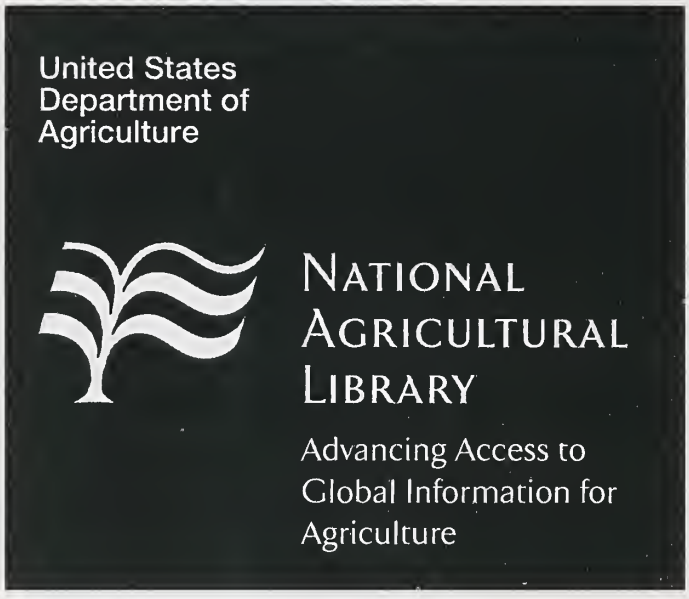
Agricultural Research Service (ARS)
&
National Agricultural Library (NAL)

Cooperative State Research, Education, and Extension Service (CSREES)

Economic Research Service (ERS)

National Agricultural Statistics Service (NASS)

MAY 1996


United States
Department of
Agriculture
NATIONAL
AGRICULTURAL
LIBRARY
Advancing Access to
Global Information for
Agriculture

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CHAPTER I

Research, Education, and Economics (REE)

REE Long-Range IRM Plan FY 1997 - 2001

A. REE INTRODUCTION

USDA Reorganization

In October 1994, the President signed the Federal Crop Insurance Reform and Agriculture Reorganization Act of 1994, Public Law No. 103-354 which reorganized the Department of Agriculture. This Act established new sub-cabinet positions, restructured headquarters and Agency offices, reduced personnel, and consolidated or closed 112 field office locations. The overall purpose of the reorganization was to deliver USDA programs and services to the public in more cost-effective ways.

REE Created

This major reorganization created a new Under Secretary for Research, Education, and Economics (REE). The former Cooperative State Research Service (CSRS) and the Extension Service (ES) were joined to form the Cooperative State Research, Education, and Extension Service (CSREES). The National Agricultural Statistics Service (NASS) and Economic Research Service (ERS) remain separate agencies under the new REE. The Agricultural Research Service (ARS) remained a separate agency and absorbed the National Agricultural Library.

The Economics Management Staff (EMS), which supported administrative functions for NASS and ERS, was eliminated. The personnel and funds were transferred to ARS to form a new consolidated administrative and financial unit to support all of REE.

REE Mission Statement

To create, apply, and transfer knowledge and technology to provide affordable food and fiber, ensure food safety and nutrition, protect the environment, and support the rural development and natural resource needs of people by conducting integrated national and international research, information, education, economic, and statistical programs and services that are in the national interest.

REE Agency Mission Statements

ARS

Provide access to agricultural information and develop new knowledge and technology needed to solve technical agricultural problems of broad scope and high national priority to ensure adequate availability of high-quality, safe food and other agricultural products to

meet the nutritional needs of the American consumer, to sustain a viable and competitive food and agricultural economy, to enhance quality and life and economic opportunity for rural citizens and society as a whole, and to maintain a quality environment and natural resource base.

CSREES

Work with partners and customers to advance research, extension, and higher education in the food and agriculture sciences and related environmental and human sciences to benefit people, communities, and the nation.

ERS

Provide economic, other social science information and analysis for public and private decisions on agriculture, food, natural resources, and rural America. A program of economic and social science research, analysis, and data dissemination supports decisions by the Executive Branch, the U.S. Congress, environmental consumer and public interest groups, including farm and industry groups, and the general public.

NASS

Serve the United States, its agriculture, and its rural communities by providing meaningful, accurate, and objective statistical information and services.

B. REE IRM PLANNING PROCESS

REE IRM Advisory Council

This council serves as a coordination and information sharing body for information resource management (IRM) issues affecting REE. This council is comprised of the agency Senior IRM Officials (SIRMO's) from each of the four agencies.

REE Strategic Plan

A five year strategic plan has been developed that guides REE into the 21st century. The plan along with annual performance plans constitute the REE response to the Government Performance and Results Act (GPRA), and is used to communicate REE programs and priorities to employees, customers, partners, and other constituents.

New developments in computer, communication, and related technologies have made it

possible to transmit information almost anywhere in the world in a variety of data formats, including image, voice, and video. Agencies in the REE mission area are both major creators and users of new technologies. Access to information technologies is key to organizational and program success. REE agencies must plan to acquire and use these available technologies to strengthen their ability to achieve goals more effectively and efficiently. A major issue facing the mission area in implementing this plan is the availability of investment funds for the purchase and implementation of these new technologies. Because the long-term payback from technology investments is significant, the REE mission area will develop an acquisition plan during the five year strategic plan.

C. CURRENT IRM ENVIRONMENT

ARS, CSREES, ERS, and NASS have retained functional responsibility and the resources to develop and operate their unique information management systems and technology needs. Therefore, each Agency has prepared its own IRM plan as a component to the overall REE mission area for this planning cycle. Because ARS functions as the lead Agency for administrative support services, it coordinated its administrative and financial systems plans with the other REE agencies.

D. ACCOMPLISHMENTS/FUTURE DIRECTION

INFORMATION ENGINEERING

REE is using an information engineering (IE) methodology to plan, analyze, design, and build enterprise-wide administrative information systems. The goal of IE is develop information systems which deliver the right information to the right people at the right time. The four stages of IE are:

Information Strategy Planning - identifying priorities derived from high-level examination of an organization's functions, current information processes, and future information needs. Management uses the ISP to define key business areas and determine priorities for detailed analysis.

Business Area Analysis - Examining in detail the functions within a business area to determine interrelationships, processes, and data requirements.

System Design- Specifying the details of how processes work within a business area.

Construction - implementing systems for a business area from design specifications.

Information Strategy Plan

In April 1995, REE completed an information strategy plan (ISP), the deliverable from the planning stage of the IE process. The ISP provided analysis, findings, and recommendations to base future systems planning. The following documents were part of the ISP.

1. Business Strategy Plan
2. Information Architectures
3. Information Needs Analysis
4. Business Systems Analysis
5. Technical Architecture
6. Information Management Organization Analysis

The REE IE Steering Committee approved conducting two BAA's: one for budget and financial management and one for human resources. Also approved was a high priority project to develop a system for producing a personnel directory and locator system.

Business Area Analyses

The information gathered during the ISP project served as a baseline for the BAA projects. The BAA teams consisted of the REE agencies and IE specialist. The business area experts provided their knowledge of their business area, augmented by documentation and informal interviews, to develop the BAA deliverables.

Budget, Finance, and Accounting (BFA). The scope of the BAA covered budget formulation, budget execution, and operational accounting functions. The BFA team's accomplishments fall into three categories: (1) process and data models in the financial business area, (2) assessment of the new USDA Foundation Financial Information System (FFIS), and (3) the identification of 10 possible business improvement opportunities.

Human Resources (HR). The scope of the BAA covered pay administration, position management, employment, employee development, and labor relations functions. The HR team's accomplishments fall into four categories: (1) process and data models for functions above, (2) the identification of 14 possible business process improvements, (3) information to support the Rapid Application Development (RAD) of a personnel directory/locator system, and (4) preparations to coordinate future system initiatives with the Department's Modernization of Administrative Processes (MAP) initiative.

Process and Data Models

The BAA teams developed data and process models for the select functional areas. A data model is a graphical representation of business information (entities), vital business relationships, and attributes used to describe the information. A process model is a graphical representation of a group of business activities that together support the mission of the enterprise. These models can be used to assess technology feasibility, assess software packages, assess the impact of proposed changes, facilitate end-user access to data, enable strategic overview of REE's information needs and migrate data from one technology to another. They also establish common terminology and definitions.

USDA FFIS Assessment

The BFA BAA assessed REE requirements in support of the implementation of USDA's Foundation Financial Management System (FFIS), a new automated general ledger system. The BAA team compared information and processing requirements with FFIS information structures and high level functional capabilities. The understanding and documentation of REE financial system requirements is mandatory for an orderly conversion to FFIS. Now ARS is ready to participate as one of the pilot agencies and will be able to facilitate subsequent implementation throughout REE.

With the completion of consolidated REE high-level financial business models, the BFA project team concluded that FFIS is likely to fulfill many of the REE core data requirements. The team recommended that ARS move forward with the first stages of FFIS implementation. Small scale current system assessments may be necessary to determine which agency systems can be retained within the FFIS operating environment.

Business Process Improvement Opportunities

During both BAA information gathering sessions the functional specialists identified 23 opportunities to improve financial operations. Within financial management, seven of the nine opportunities identified have linkages to the eventual operations of FFIS. HR already was implementing three of the fourteen HR BPI's when the project concluded.

CHAPTER II

Agricultural Research Service (ARS)

ARS Long-Range IRM Plan FY 1997 - 2001

A. ARS INTRODUCTION

Organizational Structure:

The ARS consists of 104 domestic research locations. Each location reports to one of eight Area Directors. Each Area Director manages research programs across a multi-state geographic area. Each Area Director reports directly to the Administrator of ARS. In addition, there are two foreign research locations which report to the Assistant Administrator for Office of International Research Programs (OIRP) who reports to the Administrator of ARS. There are 6650 permanent ARS employees with approximately 210 specialists involved in information technology systems.

ARS Strategic Plan

Since 1983, ARS has developed a series of multi-year strategic plans to help guide development and management of the agency's work. In 1993, the Government Performance and Results Act (GPRA), Public Law 103-62, was enacted. It seeks to make all Federal departments and agencies more programmatically accountable to Congress and the U.S. taxpayers. ARS has developed a Strategic Plan, covering fiscal years 1998-2002, in accordance with GPRA requirements.

ARS Management Structure

ARS consists of two management components: Program Management (PM) and Administrative and Financial Management (AFM). The ARS Administrator has two Deputy Administrators.

- The Deputy Administrator, National Program Staff (NPS), is responsible for planning and directing the research programs of the Agency on behalf of the Administrator.
- The Deputy Administrator, AFM, directs the administrative and financial programs of the Agency through six Division Directors.

The Agency organizational chart (Exhibit 1) displays the organizational alignment.

Program Management (PM)

PM establishes and coordinates many research programs using various technology. PM operates in a highly advanced decentralized environment with heavy usage of INTERNET E-mail to communicate with colleges and universities.

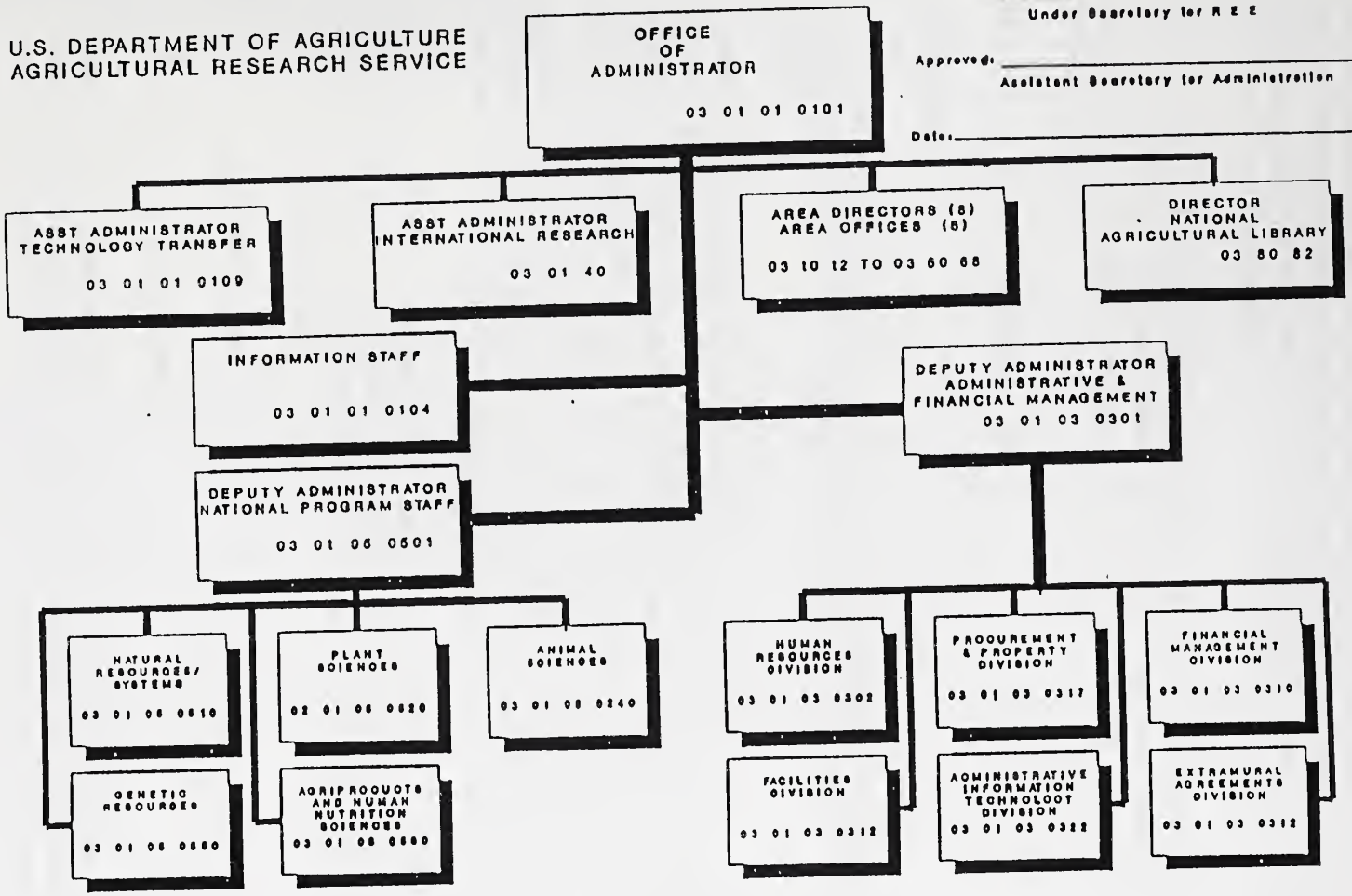
Recommended: _____
Administrator

Concur: _____
Under Secretary for R E E

Approved: _____
Assistant Secretary for Administration

Date: _____

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE



MISSION: Provide access to agricultural information and develop new knowledge and technology needed to solve technical agricultural problems of broad scope and high national priority to ensure adequate availability of high-quality, safe food and other agricultural products to meet the nutritional needs of the American consumer, to sustain a viable and competitive food and agricultural economy, to enhance quality of life and economic opportunity for rural citizens and society as a whole, and to maintain a quality environment and natural resource base.

SUPERSEDES CHART DATED 12/28/92

Prepared by: ARS Personnel Division

EXHIBIT 1

Administrative and Financial Management (AFM)

AFM provides administrative and financial management support to the REE agencies. This support includes human resources, procurement, property, accounting, telecommunications and records management. AFM operates in a centralized environment utilizing standardized technology such as E-mail, Novell LAN's, standard 486 and Pentium Personal Computers (PC's), and Novell GroupWise.

IRM and the AFM strategic plans play a critical role in implementing research priorities outlined in ARS' Six Year Implementation Plan. It links almost all of the Agency's administrative and program management in coordinated support of the Agency's national research priorities.

1. PROGRAM MANAGEMENT

Introduction

The ARS provides leadership and conducts basic and applied research at Federal laboratories to solve problems encountered by agricultural producers and consumers of farm and ranch products.

Traditionally, agricultural problems have been solved through research involving the collection of data for individual components of a system, such as soils, plants, insects, and livestock. However, complete agricultural systems are so complex that evaluating them by direct measurements is not practical. Today, data must be assembled into models of systems that can account for the interactions among components. For this reason, many ARS research programs include efforts to develop computer models that can be used to simulate the interactions within an agricultural system. The research also includes experiments designed to determine the relationships needed to drive the models and to test their validity.

Current broad areas of emphasis include efficient food and fiber production, ground water, and other natural resource concerns of agriculture, food safety, development of new products and uses for agricultural commodities, and support of USDA regulatory and technical assistance programs.

Research Program Objectives

Objective 1. Soil, Water and Air

Research addresses environmental concerns of both the agricultural industry and general public. Research projects assist in development of a sound scientific basis to provide advanced technical assistance and education to producers to manage, protect, and conserve

soil water and air resources.

Objective 2. Plant Productivity

Research addresses a wide range of crop production issues. These include pest and disease resistance, maintenance and improvement of plant germplasm for increased production efficiency, and increasing the understanding of basic plant development and function for long-term enhancements in crop production.

Objective 3. Animal Productivity

Research focuses on major livestock and poultry issues. They include nutrition, genetics, reproduction, disease research, and food quality and safety issues.

Objective 4. Commodity Conversion and Delivery

Research focuses on food safety and quality concerns, development of new food and industrial uses for agricultural commodities, and elimination of barriers to export of commodities.

Objective 5. Human Nutrition and Well-Being

Research seeks methods to determine the composition of foods and to improve food nutritional quality. Scientist examine the role of dietary components in weight maintenance and in chronic disease. ARS is the lead Federal agency for human nutrition research.

Objective 6. Integration of Systems

ARS develops integrated systems for efficiently producing, processing, and marketing agricultural products to meet human needs while improving the natural resource base. Integrative systems research is aimed at more general goals such as developing systems engineering capability for the Agency to better plan and set priorities for implementation strategies.

Objective 7. Information and Library Services

The goal is to ensure and enhance access to agricultural information for a better quality of life through the programs of the National Agricultural Library (NAL) - the library of the U.S. Department of Agriculture and the primary agricultural information resource of the United States.

Planning Processes

ARS Program Plan

ARS developed a 6-year Program Plan which serves as the business plan. Agency IRM functions and activities are oriented to support this Plan. Objective 6 in this Plan specifically directs integrating scientific knowledge of agricultural production, processing, and marketing into systems which use resources optimally and facilitate the transfer of technology to users.

ARS Resources Management System (ARMS)

The nature of the research being performed in support of the Program Plan determines the type of resources needed. The formulation of major research plans identify the specific computing resources.

As part of the ARMS implemented through Annual Resource Management Planning System (ARMPS), all ARS managers develop yearly plans for how their resources (facilities, equipment, personnel, extramural agreements) are to be used to support Agency priorities. More specifically, each location develops its resource requirements. The Administrator annually reviews each location's research activities and resource requirements with the National Program Staff and other advisors during the first month of the fiscal year. The need for computing resources is included in this review. These plans are reviewed by their supervisors and approved in final by the Administrator of ARS. The results of this review translate into an approved funding plan for the fiscal year.

Major Research Systems

ARS has increased research emphasis on promoting an environmentally- sensitive agriculture and supporting the development of new knowledge which addresses critical issues in food safety. Primary research programs emphasize water quality, global change, new biological controls, integrated pest management strategies, and alternative fuels production.

Germplasm Research Information Network (GRIN):

The mission of the GRIN is to provide support to the national research programs whose missions are to acquire, maintain, evaluate, utilize, and make available to scientists a wide range of economically important plant, animal, microbial, insect, and forest trees germplasm. This germplasm provides the genetic diversity necessary to improve agricultural productivity to reduce genetic vulnerability in future food and agriculture development. The germplasm is maintained by networks of cooperating institutions, agencies, and research units in the federal, state, and private sectors with ARS providing the national leadership. The GRIN database accumulates information about the preserved germplasm. It provides an automated

retrieval capability for the collection and dissemination of germplasm information to scientists who are the users of the germplasm, and to managers and collection curators.

Global Climate Change Research Program:

The goal of this program is to develop a comprehensive model for the land-based biosphere component of the Earth as an integrated system comprising land, ocean, and atmosphere. The model is a means of understanding how both natural and human-induced processes will cause future environmental changes. As implied by its purpose, the development of the model will require complex integration of different types of data from many sources. The information will be the basis of designing response strategies that secure the continued productivity and health of human life-support systems. The U.S. Congress directed the Department to contract this data assessment (Ref: Agriculture, Rural Development, FDA and Related Agencies 1992 Appropriations Bill-Conference Report - H.R. 102-239).

Animal Improvement Program Laboratory (AIPL):

The mission of the AIPL is research, development, and verification of sophisticated procedures for genetic evaluation of dairy cattle based on nationwide data obtained through the National Cooperative Dairy Herd Improvement Program (NCDHIP) Research is directed at genetic improvement of yield of milk and non-yield traits that affect the health, vigor, longevity, and profitability of dairy cattle.

Plant Genome/Animal Genome Mapping Programs:

These related programs are essential for the U.S. to maintain and strengthen a strong global position in agricultural efficiency and profitability. In this initiative ARS is responsible for providing Federal leadership in developing the program to provide a comprehensive picture of what genes are present in plants, their arrangement within chromosomes, what traits they control, and how they function.

Researchers will eventually complete the gene mapping of plant species of economic importance. Methods for collecting and validating data, and supporting users of the information will have to be developed. Much of the project will be accomplished extramurally with coordination and program management by ARS. The National Agricultural Library operates the database system. Eventually, scientists will have access through a network to more intensively coordinated plant gene mapping initiative. The gene mapping program will be closely integrated with the ARS germplasm program.

Current PM IRM Environment

Information Technology for Research

Virtually every research project involves some facet, to one degree or another, the management of information resources. Often, new systems are essential in response to a new mission or program redirection. In other situations, increased computing capability needs evolve as the research program itself evolves. The early successful application of automation often generates the need for additional computing resources, thus enhancing the results of the research project.

Throughout the ARS research laboratories, specialized state-of-the-art computer capabilities such as data acquisition devices, statistical computing, scientific graphics, decision support systems with imbedded expert systems, and simulation modeling programs facilitate and enhance research projects. The nature of the research being performed will determine the type of computing resources needed at each location.

Application Strategies

ARS researchers readily identify situations where their research would benefit from the application of computer technology. They have a wide range of information resource needs. Some researchers have a modest need consisting of a personal computer to do word processing for manuscripts, correspondence, and some record keeping. At the other extreme, our researchers are involved in more computing intensive activities such as modeling, statistical analysis, and maintenance of complex research databases. Scientists are continually exploring new technologies as part of their efforts to remain on the cutting edge of research.

ARS relies heavily on the private sector for new automation technologies which can be used in its research efforts. ARS seeks to maximize the use of existing technologies as well as newly emerging ADP technology to enhance agricultural research both now and in the future. ARS uses personal computers (PCs) in Headquarters, Area, and field offices. ARS offices use local area networks and modern private branch exchange (PBX) telephone equipment.

The ARS Research Program Plan concerns the development of improved ways for integrating scientific knowledge of agricultural production, processing, and marketing. The Program Plan calls for increased emphasis on integrative systems research and describes the emphasis on databases for improving evaluations of nutritional status, and assimilation/integration of biological and physical research data into systems for analyzing complex interactions of two or more research areas, for example, animals, plants, and environments. The IRM strategies support this objective.

IRM and Research Programs

National Program Staff (NPS):

The NPS maintains a database of information on research program activities and accomplishments.

Budget and Program Management Staff (BPMS)

BPMS maintains and distributes information on ARS budgets and program allocations.

Office of Technology Transfer (OTT):

This office maintains a database on ARS scientific accomplishments which is accessed by Government and non-Government users.

Future Research IRM Direction

ARS will continue to seek to improve its capability to manage its research activities. ARS will seek to develop Agency wide databases which integrate all relevant program and administrative management data.

ARS research planning is based on problem identification; specification of goals, objectives, and expected outcome; identification of gaps in knowledge that impede solution of specific problems. To integrate these factors, ARS will use systems-based decision methods such as decision trees and critical path analysis.

The evolution of ARS programs toward larger, more interdisciplinary and cross-cutting programs requires integrated databases and management information systems.

ARS needs systems that optimize resource management and facilitate transfer of technology to users. ARS information systems must provide useful, accurate information in support of program decisions and effective resource utilization. This will demand functional information management which is both comprehensive and responsive to change. There is a constant need to provide researchers with appropriate IRM tools. Researchers are enthusiastic about applying the capabilities of automation to facilitate and enhance their work. Successful systems accomplishments are shared with colleagues who are interested in the technology.

2. ADMINISTRATIVE AND FINANCIAL MANAGEMENT

IRM Organization

The Administrative Information and Technology Division (AITD) administrative systems development, and information management and technical support for telephone/voice, records management, copier management, directives and forms management, mail and distribution management, and related paperwork management functions to the REE agencies.

The Division organizational chart (Exhibit 2) displays the new organizational alignment.

CSREES, NASS, and ERS retained technical information technology support for their unique program missions.

ARS Support

AITD's mission also includes providing customer-focused administrative information resource management services to ARS, in the areas of systems design, systems development, hardware and software support, communications, records, forms, mail management, and directives, and related activities.

IRM Leadership

The IRM functions are led by Timothy O. Tyler, Director, AITD, who reports to the Deputy Administrator, Administrative and Financial Management. Mr. Tyler serves as the ARS Senior IRM Official (SIRMO) and is a member of both the REE IRM Advisory Council and AFM/IRM Council.

AITD Strategy Plan

Under the Government Performance and Results Act, a strategic plan has been developed for accomplishing its mission and achieving the information management objectives requires a planned and orchestrated set of activities in the following areas:

- Implementing a comprehensive, integrated technical infrastructure and architecture including a state-of-the-art computing, network, and telecommunications infrastructure;
- Expanding state-of-the-art office automation technologies;
- Promoting REE-wide computer literacy through training and education; and

Administrative Information & Technology Division
Functional Assignments
1995

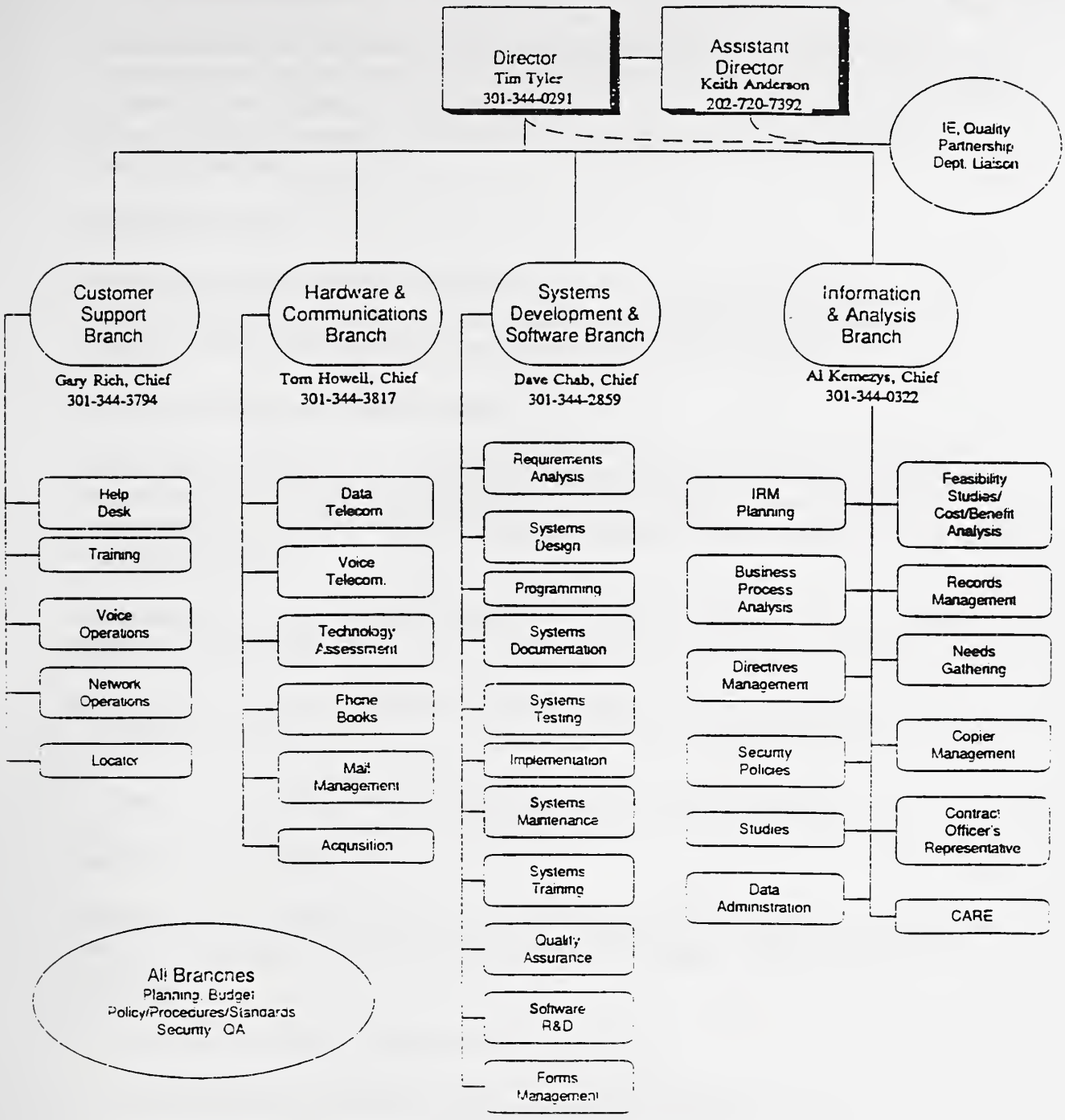


EXHIBIT 2

- Implementing Quality Partnership, formally TQM, based customer service to support end users working with the current technical infrastructure and software applications truly integrated systems.

Whenever appropriate, the Agency will rely on contractor support to identify and test relevant new technologies for scientific and administrative system applications. These efforts will include expanded use of new technologies such as networking facilities, client server, database management systems, and automated text storage and retrieval technologies as well as innovative software.

AITD Organization

AITD has four branches which are intended to provide more flexible and streamlined resources and support an environment characterized by constant change in needs and capabilities. Specific IRM responsibilities of these units are described below.

Hardware and Communications Branch

The Hardware and Communications Branch researches and develops new technologies in telecommunications, networking, and hardware. This includes: voice and data communications, Local Area Networks, Wide Area Network, hardware analysis and acquisitions for REE.

This Branch evaluates, acquires, and implements hardware, software and office automation services to customers including:

- Support for voice, data, and video telecommunications and local and wide area networks systems support; and

- Support for installing and implementing hardware and standard software.

Customer Support Branch

The Customer Services Branch provides technical support services primarily to customers in AFM, with some support to others in ARS and the REE agencies. This Branch is responsible for:

- Hardware and software support and troubleshooting;

- Voice and phone communications support and troubleshooting;

- LAN/WAN administration and support;

- User training;
- Security Operations;
- Hardware, software, and telecommunications implementation;
- Planning and coordinating IT procurements;
- Customer communications;
- Quality control; and
- Electronic mail administration and support.

Systems Development and Software Branch

This Branch is responsible for systems analysis, design, and programming for REE administrative systems. Assigned computer specialists determine the nature of requirements, logical work, information flows, and analyze advanced hardware and systems technologies applications. In fulfilling this responsibility the Branch performs the following general functions:

- Develops information technology and quality assurance standards;
- Designs, redesigns, modifies and maintains national Administrative systems;
- Tests and evaluates software;
- Provides data base management oversight and management;
- Defines policies and procedures for the development of national automated systems; and
- Develops REE Locator\Directory system.

Information and Analysis Branch

This Branch is responsible for leading and coordinating the general aspects of information management for REE. The Branch:

- Leads the Mission Area's Information Engineering Initiative;

- Coordinates the development and prepares the REE's annual Long-Range IRM Plan;
- Maintains the REE records, mail, copier, directives, forms and paperwork management functions;
- Formulates the ARS ADP/IRM budget information;
- Develops and oversees the ARS Information Systems Security Program; and
- Formulates and implements ARS IRM policies and standards.

Other IRM Support Units:

Headquarters AFM Divisions

Headquarters AFM Divisions lead the development of automated and other information processing systems in their functional areas.

Property and Procurement Division

This Division supports contracting and acquisition processing for information technology resources. Assists in developing final, detailed specifications for major ADP acquisitions.

Area Administrative Offices (AAO's)

Area Computer Specialists (ACS) provide computer expertise to the Area Offices and to their assigned field units in implementing and administering National systems.

B. IRM PLANNING PROCESS

IRM Planning

AITD prepares the ARS Long-Range IRM Plan. Key Agency managers and functional specialists are interviewed to determine the status of their information resource initiatives. The IRM Plan keeps senior management aware of progress on specific information systems. This plan addresses the needs for providing ongoing administrative support to REE programs and the continued development of effective administrative and financial systems.

AFM/IRM Council

This Council serves as a senior advisory group to the Deputy Administrator, Administrative and

Financial Management (DAAFM), to improve resource allocation decisions. Members of the Council are the AFM Division Directors, two Area Administrative Officers (AAO's), and the coordinator of the Consolidated Assistance, Review, and Evaluation Program (CARE). The Council:

- Develops and maintains an awareness of the IRM needs of administrative functions at all organizational levels;
- Reviews all proposed automation initiatives which affect more than one organizational unit, develops recommendations for approval, and monitors the status of approved initiatives;
- Provides recommendations on the development of the Long-Range Plan;
- Reviews progress and AFM support requirements for Departmental information technology initiatives such as the Modernization of Administrative Processes (MAP) and Financial Information Systems Visionary Strategy (FISVIS).
- Promotes the timely sharing of IRM information across all administrative and financial activities;
- Assures the inclusion of timely training of end users in all system development activities; and
- Facilitates an ongoing dialogue with PM on cross-cutting IRM issues.

C. CURRENT IRM ENVIRONMENT

The establishment of system inter-connectivity is essential to support the consolidated administrative support services provided by AFM to ARS. Emphasis continues to be placed on national systems which support the program goals and objectives. ARS uses the National Finance Center's (NFC's) databases as its official database except where unique internal requirements dictate otherwise.

Control and coordination of Agency wide information systems requirements are being achieved through standards and standardized hardware/software, the development of data dictionaries, maintenance of software libraries, training of system users, and the allocation of IRM resources according to management priorities.

System Platforms/Technology

Personal computers (PC's) are the principle automation technology tools in use. All ARS Headquarters, Areas and Locations have computing and data communications capability through

PC's. All of ARS uses the FTS2000 network. Each year more users are transmitting data files and accessing databases at facilities inside and outside the Agency.

Local Area Networks (LAN)

In AFM, a Novell LAN supports AFM in Greenbelt and Washington, D.C. Complex offices. The system consists of eight file servers, three cluster controllers, two modem pools, and four X.25 Gateways to NFC and the National Computer Center (NCC). The system uses fiber optics. All ARS Area Administrative Offices and the National Program Staff have installed and upgraded Novell LANS.

E-Mail

The e-mail infrastructure, using Novell's GroupWise electronic mail, exists between the Headquarters and the Area Offices. All REE agencies are linked through e-mail communication using GroupWise, FTS2000 Mail, and Internet. AFM is working on a Wide Area Network (WAN) to connect all REE LANS.

Telecommunication

Telecommunications will continue to be a major area of emphasis for ARS. Employees will have increased access to information and will be sharing data across their Agency and with other organizations. ARS expects to increase high speed access to databases in support of researchers and other specialists. ARS expands its use of local/wide area networks and increases its information sharing capability, it will increase its attention to security issues.

To further enhance telecommunications the use of two-way video has been Implemented at 26 ARS locations and 6 Land Grant Universities. With the implementation of two-way video, it is anticipated that a 25 percent cost reduction in travel expenses could be anticipated.

Teleconferencing

ARS uses the Department's audio teleconferencing facility to direct and coordinate activity with key personnel. Internal communications have been dramatically improved while travel requirements have been reduced. Management information is now shared more equally within the organization.

Satellite Network

During 1994, AITD implemented a Satellite Downlink Network within ARS, AM, Area Offices and Locations. This network has provided a cost-effective training mechanism that reaches all employees. Some of the training has been mandated for all employees to receive, such as Sexual

Harassment, Aids in the Work Place, and Ethics. The network has also been used for getting messages to all employees, concerning retirement planning, management training, and messages from the Secretary of Agriculture. This program was completed within four months and has saved the Agency training and travel costs.

D. ACCOMPLISHMENTS

One of the major challenges in the coming years includes development of more cost-effective means to interface with the NFC. ARS is supporting the development of integrated administrative systems through the following accomplishments:

Personnel Action Tracking

Complete development and implementation of the Personnel Action Tracking System (PATS). The system integrates data from NFC downloaded files with current action information, to provide current information on the status of a pending personnel action (SF-52). Use of the most current downloaded NFC information reduces data entry requirements.

Area Query System

Implemented an automated system to provide Area managers and Area personnel assistants with current personnel information from the NFC payroll/personnel systems. The Area Query system provides access to an electronic employee alpha roster, position organization listing, and various report formats.

Organization Address and Telephone Information System - OATIS

Completed development and implementation of an electronic system which integrates employee information with organizational and duty station information to provide an electronic means to link employees with office addresses and telephone numbers. The system provides telephone and address information based upon the organizational structure code that the employee is assigned to. The system is available for downloading on the Internet through the ARS Homepage.

Standard Letters, Forms and Vacancy Announcements

Developed and implemented several standard letters and forms used in various human resources processes, as well as standardized vacancy announcement formats. Use of the standard formats reduces response time.

Federal Acquisition Computer Network (FACNET)

ARS is participating in the Small Purchasing Electronic Data Interchange software pilot with the Department. All software installations are completed in the Greenbelt Small Purchasing section. Quarterly meetings are held with the department for system upgrades, modifications, and information sharing.

Small Purchasing System (SPS)

Together PPD and AITD developed the AD-700 electronic form front end to our current small purchase tracking system (SPS). This form is currently being tested and should be implemented in FY 96. The SPS system has been implemented as a pilot in the South Atlantic Area.

Delegation of Authority System

This database system has been implemented internally to track delegations of Authority and Credit Card information.

MAP Initiative

The Department's Modernization of the Administrative Process (MAP) initiative will ultimately integrate into one automated system all of the administrative functions which OFM supports through the many systems operated at the NFC. Such a system would streamline transaction processing within the REE mission areas as well as with other USDA Agencies and other government agencies.

ARS personnel within the Property and Procurement Division are detailed to the MAP's Purchase Card Reengineering Project and Procurement Systems Modernization Project (PSMP). A Area Administrative Officer is devoted towards providing leadership for the pilot testing of Map's Purchase Card/Third Party Draft Business Process Reengineering Project.

FISVIS Initiative

The Financial Information Systems and Visionary Strategy (FISVIS) is viewed as an important systems development enterprise. There is a tremendous need for a single financial information system.

ARS will be a pilot agency to begin implementing the NFC's funds control system. The REE Information Engineering project will be coordinating its business area analysis of REE integrated financial management and financial planning, allocation, and execution.

A senior position within the Financial Management Division is devoted towards managing joint

Departmental/REE initiatives of which a primary responsibility will be to develop a comprehensive plan regarding REE interaction with the Departmental/NFC FISVIS initiative.

USDA is responding to a changing financial environment and is working to integrate a large number of disparate financial information systems at the National Finance Center. Under the FISVIS initiative, the Department is replacing the current general ledger system with a new core financial system called the Foundation Financial Information System (FFIS). This system will help the USDA streamline financial system operations for all the agencies. The REE budget, finance, and accounting Business Area Analysis (BAA) documented the high level information requirements that will aid developers implement the FFIS in REE.

An REE implementation team is planning for FFIS. The team will examine the FFIS system through hands-on experience with a demonstration system. Then, it will begin work to establish a small scale REE prototype on which to apply its requirements and experiment with FFIS capabilities. The team will then plan data conversion, identify agency reporting requirements, determine agency user groups, define security needs, and study training needs.

E. FUTURE DIRECTION

AFM Strategic Plan

These are challenging and demanding times for AFM and it customers in the Research, Education, and Economic (REE) mission area. The pace of change, which has accelerated rapidly is expected to continue for the foreseeable future. Expectations for quality service will continue to grow despite tighter budgets, fewer FTE's, consolidations of functions, and continued regulatory constraints.

AFM's success depends on it leadership in anticipating, understanding, and responding to customer needs. AFM will continually improve its services through use of its quality partnership, business process reengineering, and streamlining initiatives. AFM services will be cost effective and add value to the customers.

The AFM strategic plan is the mechanism for building a partnership with the customers and a framework for future decision making, priority setting, and resource allocation. The strategic plan is a means of unifying various initiatives and planning efforts. Based on customer input and the Agency's assessment of the future, AFM's constrained resources will be better focused on providing, or improving upon, critical core services while eliminating those services that are no longer needed. The strategic plan communicates clear action plans with performance targets and indicators by which customers and employees can measure AFM's overall performance.

One of the strategic outcomes focus is to increase AFM's ability to effectively use technology

and automation tools to help improve service capability, assist in the overall communications process, and ease some of the pressures of downsizing and tighter budgets. AFM will stay abreast of technology advances and seek improvements to the systems which cause the least amount of disruption in customer service.

Information Engineering

By using information engineering methodology and integrated computer aided software engineering (I-CASE) tools, AFM expects to streamline processes and to create the needed integrated management information systems. Offices will need ways to integrate incoming paper documents with internally generated digital, film, and paper media.

AFM plans to implement centralized REE-wide data administration for administrative systems. ARS will continue its efforts to reduce paperwork and streamline information flows for its program and administrative management processes. Management is currently evaluating potential system development options based on the results of the two BAA's and progress being made with Department initiatives.

Telecommunications

Telecommunications will continue to be a major area of emphasis for ARS. It strives to maximize its communication and information transfer capabilities. The Agency will seek to optimize use of FTS 2000. Employees will have increased access to information and will be sharing data across the Agency and with other organizations. ARS expects to increase high speed access to databases in support of researchers and other specialists. As ARS expands its use of local area networks and increases its information sharing capability, it will increase its attention to security issues.

To further enhance telecommunications, the use of two-way video will be investigated for REE. The first task will be a feasibility study to connect AFM and all ARS Area offices. The second phase of this objective will be to implement two-way video for the Area Offices and to establish connections with locations within each area. With the implementation of two-way video, it is anticipated that a 25% cost reduction in travel expenses could be anticipated.

1. **Objective 0-1: Germplasm Research Information Network**

2. Status: Upgrade Completed

3. Objective Statement:

   Improve and sustain quality support of the National germplasm research systems for plant, animal, microbial, insect, and aquaculture programs.

4. Strategy:

   ARS needs to apply current computer technology to modernize the centralized computer database. ARS will develop a relational database to speed response and expand access for breeders and other users.

5. Program(s) Supported:

   The development of a relational database for germplasm research supports ARS Program Plan Objective 2, Plant Productivity, and Objective 3, Animal Productivity.

6. Cross-cutting or Interagency Program Supported:

   Not Applicable

7. Background:

   The mission of the GRIN is to provide support to the national research programs whose missions are to acquire, maintain, evaluate, utilize, and make available to scientists a wide range of economically important plant, animal, microbial, insect, and forest trees germplasm. This germplasm provides the genetic diversity necessary to improve agricultural productivity to reduce genetic vulnerability in future food and agriculture development. The germplasm is maintained by networks of cooperating institutions, agencies, and research units in the federal, state, and private sectors with ARS providing the national leadership.

   The GRIN database accumulates information about the preserved germplasm. It provides an automated retrieval capability for the collection and dissemination of germplasm information to scientists who are the users of the germplasm, and to managers and collection curators. Specifically, GRIN:

Objective 0-1 Germplasm Research Information Network (GRIN) (Continued)

- Enhances communications with scientist regarding the location and characteristics of plant, animal, insect, microbial, and aquaculture germplasm;
- Permits flexibility to user in storing and retrieving information;
- Optimizes operational speed for all users; and
- Reduces redundancy and relates information about each germplasm accession.

The system operates on a Sun Computer System using a Unix operating system and Oracle RDBMS software.

8. Contact: Jim Mowder
Phone: 301-504-5666
Germplasm Research Information Network, Plant Sciences Institute, Beltsville, MD.

9. Major Milestones:

Activity	Planned Start Date (quarter)	End Date (quarter)	Actual End Date (quarter)
a. Upgrade hardware/software	2/96	3/96	3/96
b. Upgrade hardware	1/97	1/97	1/97
c. Upgrade hardware/software	1/98	3/98	3/98
d. Upgrade hardware	1/99	3/99	3/99
e. Upgrade hardware/software	1/00	2/00	2/00

10. Resources:

thru Total	FY96	FY97	FY98	FY99	FY00	FY01	TOTAL
Costs ($000)	4,145	530	825	740	785	785	7,810
Staff Years:	75.0	10.0	10.0	10.0	10.0	10.0	125

* NOTE: The FY 1996 figure is an accumulation of prior year costs for this objective.

Objective 0-1 Germplasm Research Information Network (GRIN) (Continued)

11. Acquisition Description: Not Applicable

12. Departmental IRM Implementation Framework Area Supported:

Information and Data Management

1. **Objective 0-2: Global Change Data Assessment and Integration Project**

2. Status: Continuing

3. Objective Statement:

   The goal of this program is to develop a comprehensive model for the land-based biosphere component of the Earth as an integrated system comprising land, ocean, and atmosphere.

4. Strategy:

   ARS is conducting a Department-wide global data survey, evaluating and implementing integrating mechanisms; promoting data exchange, preservation and retention; and supporting enhanced interagency and international data systems interoperability. ARS awarded a contract to study and develop the database structure.

5. Program(s) Supported:

   This Objective supports ARS Base Program Area of Emphasis Objective 1 on Soil, Water, and Air, and Objective 6 on Integration of Systems. Objective 6, Integration of Systems, is divided into six sub-objectives. One of these, 6.1 - Resource Management: Systems and Models, includes development of "holistic models that predict the integrated effects of atmospheric chemical composition, climate, and management practices on productivity, water, energy, and trace gas balance of terrestrial ecosystems, ranging from field to global scales."

6. Cross-Cutting or Interagency Program Supported:

   This supports the global change, environmental, and water quality Departmental crosscutting issues.

7. Background:

   The goal of this program is to develop a comprehensive model for the land-based biosphere component of the Earth as an integrated system comprising land, ocean, and atmosphere. The model is as a means of understanding how both natural and human-induced processes will affect future environmental changes. As implied by its purpose, the development of the model will require complex integration of multitudinal types of data from many sources. The information will be the basis of designing response strategies that secure the continued productivity and health of

Objective 0-2 Global Change Data Assessment and Integration Project (Continued)

human life-support systems.

This project applies systems engineering and analysis to assess data holdings, preserving data at risk, and maximizing data integration and systems interoperability of global data across USDA agencies. The areas of work for the multi-year project are:

- Data survey, assessment, integration and access;
- Data rescue;
- Geographic information system (GIS) integration;
- Knowledge transfer; and
- Simulation model development and evaluation.

The U.S. Congress, in the Agriculture, Rural Development, FDA and Related Agencies 1992 Appropriations Bill-Conference Report (H.R. 102-239), directed the Department to contract with the Consortium for International Earth Science Information Network (CIESIN). ARS awarded a multi-year contract with CIESIN to perform a database assessment and assembled an integrated prototype database. Follow-on development involves expansion and refinement of the database.

8. Contact: Dr. Herman S. Mayeux
Phone: 301-504-5281
Natural Resources and Systems, National Programs Staff, Beltsville, MD.

9. Major Milestones:

Activity	Planned Start Date (quarter)	End Date (quarter)	Actual End Date (quarter)
a. Database assessment and structuring	4/92	2/93	2/93
b. Database prototyping	2/93	2/94	2/94
c. Database expansion	3/94	4/98	

Objective 0-2 Global Change Data Assessment and Integration Project (Continued)

10. Resources:

thru Total	FY96	FY97	FY98	FY99	FY00	FY01	TOTAL
Costs ($000)	4259	**900	900	900	900	900	8,759
Staff Years:	75.0	0	0	0	0	0	75

* NOTE: The FY 1996 figure is an accumulation of prior year costs for this objective.
** Costs shown indicates system is in maintenance mode for FY97 - FY01.

11. Acquisition Description: Not Applicable

12. Departmental IRM Implementation Framework Area Supported:

Information and Data Management

1. **Objective 0-3: Telephones and Telecommunications Facilities**

2. Status: Continuing.

3. Objective Statement:

   ARS will modernize its telecommunication systems to effectively support the increasing voice, data, and image traffic requirements.

4. Strategy:

   ARS has initiated a telecommunications modernization program to coincide with the increased requirements of its locations, GAO recommendations, USDA requirements and the North American Numbering Plan (NANP).

   ARS has prioritized the review of its existing telecommunications facilities. Where appropriate, ARS is upgrading voice and data communications equipment. Two full-time telecommunications specialists are coordinating the Agency's modernization program.

5. Program(s) Supported:

   All ARS programs are supported by this objective.

6. Cross-Cutting or Interagency Program Supported:

   All Interagency Programs supported by ARS are supported by this objective.

7. Background:

   The ARS voice and data communications network is operating with changes in equipment technologies, network architectures, and service offerings. ARS is adjusting to new requirements and is realizing benefits from increased effectiveness and efficiency in communications. Many locations are operating obsolete private branch exchange and key telephone systems that do not support the operational and management needs of the Agency.

8. Contact: Steve Garvin
   Phone: 301-344-2872
   Administrative Information and Technology Division, Greenbelt, MD

Objective 0-3: Telephones and Telecommunications Facilities - (Continued)

9. Major Milestones. Installed systems identified for reevaluation and replacement decisions:

Activity	Planned Start Date (quarter)	End Date (quarter)	Actual End Date (quarter)
a. HNRC, MA	3/95	4/95	1/96 *
b. Miss. State, MS	4/96	TBD	
c. NPS, MD	1/94	4/96	
d. Woodward, OK	3/94	4/96	
e. Cheyenne, WY	4/95	3/96	
f. Wyndmoor, PA	2/96	4/97	
g. Plum Island, NY	4/93	4/97	
h. Watkinsville, GA	5/95	4/96	
i. Dawson, GA	1/96	4/96	
j. Albany, CA	1/95	4/96	
k. Salinas, CA	4/95	4/96	
l. Boise, ID	3/96	4/97	
m. Parlier, CA	2/96	4/98	
n. Weslaco, TX	2/96	4/99	
o. Booneville, AR	2/96	2/97	
p. Morris, MN	4/95	2/97	
q. Ames, IA	1/95	4/97	
r. West Lafayette, IN	2/96	4/97	
s. Gainesville, FL	3/95	TBD	

* Requires after implementation system reconfiguration, based on new requirements at the center.

Objective 0-3: Telephones and Telecommunications Facilities - (Continued)

10. Resources:

thru Total	FY96	FY97	FY98	FY99	FY00	FY01	TOTAL
Costs ($000)	545	1,730	700	700	500	500	4,675
Staff Years:	2.0	2.0	2.0	2.0	2.0	2.0	12.0

* NOTE: The FY 1996 figure is an accumulation of prior year costs for this objective.

11. Acquisition Description: Telephone equipment acquisitions and/or upgrades:

($000)	FY96	FY97	FY98	FY99
$ 0 - $ 100	8	0	0	0
$ 100 - $ 200	0	4	0	0
$ 200 - $ 300	0	1	1	1
$ 300 - $ 600	0	2	1	1

12. Departmental IRM Implementation Framework Area Supported:

Delivery Systems
Agricultural Research Service

1. **Objective 0-4: Program, Administrative, and Financial Management Systems**

2. Status: Continuing

3. Objective Statement:

   Develop/enhance ARS Program and Administrative Management systems through FY 2001.

4. Strategy:

   ARS plans to integrate systems for managing human, material, and facility resources into one structured, disciplined approach to attain program goals and objectives. This requires improving accountability, refining the system for allocating funds to national priorities, and refining a comprehensive annual resource management planning process.

5. Programs Supported:

   This Objective supports all of the other Objectives in the ARS Long-Range Plan and contributes to the accomplishment of the Research Objectives in the ARS Strategic Plan. The automated program and administrative systems described in this objective provide an electronic environment that enables Agency employees to access, update, report, and share information in an efficient, effective manner. Research programs benefit from automated systems enabling them to access research, funding, human, material and facility information.
   The effectiveness and success of these automated systems relies on telecommunications facilities for locating and accessing the appropriate information resource and transmitting that information between locations and within offices and laboratories at a location. This supports all other objectives that require the exchange of information outside of an isolated LAN environment. Objective 0-5, Information Engineering Methodology, ensures the integrated system approach represented by this objective is accomplished in a timely, efficient and effective manner.

6. Cross-Cutting or Interagency Programs Supported:

   This Objective supports the USDA Modern Administrative Process (MAP) initiative. The automated systems described in this objective represent a process of integrating program and administration information that is utilized throughout the Agency and ultimately shared with other agencies. ARS will coordinate its applications development to be compatible with the Departmental MAP initiative.

Objective 0-4: Program , Administrative, and Financial Management Systems (Continued)

7. Background:

Program, administrative and financial management systems have existed with focus on the ARS Area level. The national focus on planning, leadership and direction of ARS research, requires control and management from an Agency view of where we are now and where we want to go. This requires adjustment and development of systems which support this direction.

8. Contact: Timothy O. Tyler
Phone: 301-344-0291
Administrative Information and Technology Division (AITD)
Greenbelt, MD.

Objective 0-4: Program , Administrative, and Financial Management Systems (Continued)

9. Major Milestones:

Activity	Planned Start Date (quarter)	End Date (quarter)	Actual End Date (quarter)
a. Budget and Program Management Construction tracking system	4/96	4/97	
b. Financial Support Activities Modify ARMPS	2/89	3/94	3/94
c. Personnel Activities			
1. Organization Address and Telephone Information System - OATIS	9/95	1/95	1/95
2. Electronic Position Descriptions	1/96	1/97	
3. OWCP Case Information	1/95	1/96	
4. Electronic SF-52	4/96	1/96	
5. Employee Relations Case Tracking	1/96	1/97	
d. Facilities Implementation of Real Property Management Information System (RPMIS) at the Area level	1/93	1/95	1/95
e. Information Technology Activities			
1. Wide Area Network:			
Data Gathering/Develop strategy	2/95	3/95	1/96
Procure WAN Backbone hardware	1/96	1/96	
Begin Phase 1 of WAN implementation	4/96	1/97	
2. REE Directory/Locator:			
Employee Directory RAD	2/96	3/96	
Employee and Service Directory	3/96	2/97	
Employee and Service Directory System	1/97	3/97	

Objective 0-4: Program , Administrative, and Financial Management Systems (Continued)

10. Resources:

thru Total	FY96	FY97	FY98	FY99	FY00	FY01	TOTAL
Costs ($000)	4,152	491	261	263	265	250	5,682
Staff Years:	15	8	4.5	4.5	4.0	4.0	40

* NOTE: The FY 1996 figure is an accumulation of prior year costs for this objective.

11. Acquisition Description: Not Applicable

12. Departmental IRM Implementation Framework Area Supported:

Delivery Systems

1. **Objective 0-5: AITD Information Engineering Methodology (IEM) and Integrated-Computer Aided Software Engineering (I-CASE).**

2. Status: Continuing

3. Objective Statement:

AITD will implement an IEM and I-CASE throughout the REE in order to improve the quality and timeliness of the development and implementation of computerized management information systems.

4. Strategy:

AITD will train its staff and other appropriate REE staff in the IEM and I-CASE techniques. This training/technology transfer shall be conducted through a variety of training methods including, but not limited to, formal seminars, informal discussions, and hands-on participation by AITD staff in conducting the IEM tasks.

5. Programs Supported:

This objective supports all of the other objectives in the ARS Long-Range Plan and contributes to the accomplishment of the Research Objectives in the ARS Strategic Plan. The automated systems described in this objective provide an electronic environment that enables Agency employees to access, update, report, and share information in an efficient, effective manner. Research Programs described in Objectives 0-1 and 0-2 benefit from program and administrative information provided by automated systems in this objective by enabling them to access research, financial, human resources, material, and facility information.

6. Cross-Cutting or Interagency Programs Supported:

This Objective supports the USDA Modern Administrative Process (MAP) and Financial Information Systems and Visionary Strategy (FISVIS) initiatives. The automated systems described in this objective represent a process of integrating program, administration, and financial information that is used throughout the Agency and ultimately shared with other agencies. ARS will coordinate its application development to be compatible with the Departmental systems.

Objective 0-5: AITD Information Engineering Methodology (IEM) and Integrated-Computer Aided Software Engineering (I-CASE) (Continued)

7. Background:

The entire information engineering methodology involves four stages below:

1. Develop Agency Information Strategy Plan (ISP)
2. Conduct Business Area Analysis (BAA)
3. System Design (BSD)
4. Construction

In March 1995, an REE Project Team completed an REE ISP. The REE ISP deliverables included:

- Facts about the organization
- Facts about the current environment
- A model of the Information Architecture of the organization
- The Business System Architecture
- The Technical Architecture
- The final ISP report

In April 1996, two REE Project Teams completed BAA's for the Budget, Finance, and Accounting and Human Resources. The BAA teams delivered the following:

Budget, Finance, and Accounting

- Data and process models
- Analysis and recommendations for the implementation of the USDA Foundation Financial Information System (FFIS)
- Nine business process improvements (BPI's)

Human Resources

- Data and process models
- Foundation for Rapid Application Development of REE personnel locator and directory
- Fourteen BPI's

8. Contact: Al Kemezys
Phone: 301-344-0322
Administrative Information and Technology Division (AITD), Greenbelt, MD.

Objective 0-5: AITD Information Engineering Methodology (IEM) and Integrated-Computer Aided Software Engineering (I-CASE) (Continued)

9. Major Milestones:

Activity	Planned Start Date (quarter)	End Date (quarter)	Actual End Date (quarter)
a. Develop and issue RFP	1/93	3/93	3/93
b. Contract award	4/93	4/93	4/93
c. Develop Agency Information Strategy Plan	1/94	3/94	2/95
d. Prepare for Business Area Analysis/ Conduct Team Training	3/95	3/95	3/95
e. Business Area Analysis Budget and Finance	3/95	1/96	1/96
f. Business Area Analysis Human Resources * Rapid Application Development (RAD) Personnel Directory and Locator	3/95 4/95	1/96 3/96	1/96
g. Present Findings/Recommendations obtain decision	1/96	1/96	
h. Data Warehouse Feasibility Study			

10. Resources:

thru Total	FY96	FY97	FY98	FY99	FY00	FY01	TOTAL
Costs ($000)	634	294	298	300	300	300	2,126
Staff Years:	4.5	4	4	4	4	4	24.5

* NOTE: The FY 1996 figure is an accumulation of prior year costs for this objective.

Objective 0-5: AITD Information Engineering Methodology (IEM) and Integrated-Computer Aided Software Engineering (I-CASE) (Continued)

11. Acquisition Description: Not Applicable

12. Departmental IRM Implementation Framework Area Supported:
Information and Data Management

1. **Objective 0-6: Automated Food Grouping System (FGS)**

2. Status: Continuing

3. Objective Statement:

   The work will automate grouping processes. These processes relate foods reported in USDA's food consumption surveys to recipes for those foods, separate each food into its ingredients, and regroup ingredients by selected characteristics for further analysis. An automated system will allow greater flexibility and efficiency in grouping foods reported in USDA's food consumption surveys and in reporting intake in terms of ingredients or commodities.

4. Strategy:

   A Basic Agreement has been established with the General Services Administration for administrative and technical services in support of a contract to design as well as develop the operational system.

5. Program(s) Supported:

   Distribution of Agency data for Federal and public use.

6. Cross-Cutting or Interagency Programs Supported:

   Pesticide Data Program
   Third Scientific Report on Nutrition Monitoring
   EPA Dietary Risk Evaluation System
   FDA Technical Evaluations for Food Safety Issues
   USDA-DHHS Dictionary Guidelines
   Healthy People 2000

7. Background:

   The objectives of an automated FGS are to

   a) build relationships between food data reported in the food consumption surveys, supporting recipe and descriptive (grouping) files, and the data required by specific projects;

   b) facilitate grouping of foods, ingredients, and/or commodities into categories identified by the researchers;

Objective 0-6: Automated Food Grouping System (FGS) (Continued)

c) facilitate the conversion of food data from the surveys or supporting data bases into comparable forms or units;

d) reduce processing demands by selecting only the data required for building the project data set; and

e) provide links between FGS produced files and survey demographic variables for subsequent summary and analyses by standard analysis procedures.

The system must support laboratory staffs with differing skill levels in food grouping and use of computer based systems. The FGS requires access to core data files, such as the Nationwide Food Survey, which are separately managed and controlled. The systems must be flexible, reliable, consistent, and sensitive to changes in data over time. It must enable the users to take advantage of other's efforts and develop project data sets within a reasonable period of time.

8. Contact: Annetta Cook
Phone: (301)734-5809
FAX: (301)734-5496

Objective 0-6: Automated Food Grouping System (FGS) (Continued)

9. Major Milestones:

Activity	Planned Start Date (quarter)	End Date (quarter)	Actual End Date (quarter)
a. Planning (baseline analysis, requirements analysis, and Functional system design) Update the RMIS computer system to improve processing of NPS and BPMS	4/90	2/91	2/91
b. Develop Statement of Work (SOW) and Delivery Order Requirement (DOR)	2/91	2/92	2/92
c. Delegation of Procurement Authority (DPA) issued by USDA/OIRM	3/91	2/92	2/92
d. Technical Approval (TA) issued by USDA/OO	3/91	3/92	3/92
e. Issue procurement documents	3/92	3/92	3/92
f. Amend SOW and DOR and reissue	3/92	1/94	1/94
g. Issue DOR 1*	1/94	2/95	3/95
h. Issue DOR 2*	4/95	1/96	
i. Issue DOR 3*	4/95	2/96	
j. Additional DOR	2/96	4/99	

* NOTE: DOR's will be issued under existing GSA contract, therefore no milestone is listed for contract award.

10. Resources:

thru Total	FY96	FY97	FY98	FY99	FY00	FY01	TOTAL
Costs ($000)	738	200	216	400.9	0	0	1554.9
Staff Years:	1.5	1.5	1.5	1.5	0	0	6

Objective 0-6: Automated Food Grouping System (FGS) (Continued)

11. USDA IRM Framework Area Supported:

Data management and customer support

1. **Objective 0-7: Survey Net**

2. Status: Ongoing

3. Objective Statement:

   To provide for automated coding of food intake data collected in the Continuing Survey of Food Intakes by Individuals (CSFII) and other individual food intake surveys.

4. Strategy:

   To provide computer programs and database files to the Survey Contractor for coding food intake data and for recording information about new foods and portion amounts reported by survey respondents. To provide a mechanism for editing the coded food intake records and for efficient updating of database files used in the coding process.

5. Program(s) Supported:

   Agency surveys

6. Cross-Cutting or Interagency Program Supported:

   The survey food code files and supporting data are used by the Department of Health and Human Services (HHS) to support their surveys. CSFII data are used by FDA, EPA, and FTC for regulatory purposes.

7. Background:

   The assignment of food codes and maintenance of food coding databases are among the most time consuming and labor intensive efforts involved in survey operations. Traditionally, they represent the greatest obstacle in producing food and nutrient consumption data on a basis timely enough to maximize the data's usefulness to public policy administrators and other users. Because the CSFII is a critical component of the National Nutrition Monitoring and Related Research Program (NNMRRP), prompt availability of data collected in that survey is paramount to the success of that program.

8. Contact: Betty Perloff
   Phone: (301)734-5826

Objective 0-7: Survey Net (Continued)

9. Major Milestones: None

10. Resources

thru Total	FY96	FY97	FY98	FY99	FY00	FY01	TOTAL
Costs ($000)	**80	80	80	0	0	0	240
Staff Years:	1.2	1.1	1.1	0	0	0	4

** Costs shown indicates system is maintenance mode for FY96 - FY 01.

11. USDA IRM Framework Area Supported:

Data management and customer support

1. **Objective 0-8: Other Research Automation**

2. Status: Continuing

3. Objective Statement:

   Make modern computing and laboratory automation resources available to ARS scientists to foster successful achievement of research objectives.

4. Strategy:

   ARS management encourages and supports scientists' needs for laboratory automation technology. ARS scientists are constantly seeking improvements to research processes through the use computer technology. The nature of their research being performed determines the type of computer resources needed at each location. Virtually every research project is supported by IRM technology.

   The Administrator of ARS annually reviews each location's resources requirements with the National Program Staff and other advisors during the first month of the fiscal year. The need for computer resources is included in this review. The results of this review translate into an approved funding plan for the fiscal year. These decisions reflect the status of the research effort.

5. Program(s) Supported:

   The ARS Research Program is based on six objectives in the Base Program Areas of Emphasis and three Special Programs.

   ARS Base Program Areas of Emphasis:

   Objective 1. Soil, Water, and Air
   Objective 2. Plant Productivity
   Objective 3. Animal Productivity
   Objective 4. Commodity Conversion and Delivery
   Objective 5. Adequate Human Nutrition
   Objective 6. Integration of Systems

   ARS Special Programs:

   1. ARS Plant Genome Program/Animal Genome Program
   2. ARS Global Environmental Change Research Program
   3. ARS Utilization Research Program

Objective 0-8: Other Research Automation (Continued)

6. Cross-Cutting or Interagency Program Supported:

ARS supports these Crosscutting Programs:

1. Food Safety
2. Improved Human Nutrition and Health
3. Water Quality Protection
4. Environmentally Compatible Pest Control

7. Background:

ARS has 104 locations where research is conducted in many fields of agricultural science. New scientific instruments with microcomputers enable scientists to gather and process data with greater precision, control, and efficiency. In many cases, new equipment is necessary in response to a new mission or program redirection. ARS uses highly developed commercial software to conduct research.

In other cases, the need for computer resources for additional capacity or capability changes as the research program evolves. Often, the successful use of automation technology early in a project leads to the need for additional computer resources to fully develop the research.

One major software used by laboratories is the SAS software licensed from SAS Institute, Inc. ARS uses SAS products for research, statistical, and mathematical applications for market programs, laboratory activities, standardization functions, analysis, and many related Agency activities.

8. Contact Darrell Cole
Office of Deputy Administrator, NPS, Beltsville, Maryland
Phone: 301-504-5861

9. Acquisition Description: Not Applicable

10. Major Milestones: None

Objective 0-8: Other Research Automation (Continued)

11. Resources:

Category ($000)	FY96	FY97	FY98	FY99	FY00	FY01	TOTAL
Purchase of hardware & software supplies	12,530	13,200	13,350	13,275	13,360	13,535	79,250
Commercial services/ operations	2,800	3,480	3,700	4,070	4,170	4,270	22,490
SAS License	80	250	262	275	290	304	1,461
FTS 2000	3,200	3,300	3,400	3,500	3,600	3,700	20,700
Personnel	4,300	5,000	5,000	5,500	5,500	5,500	30,800
NAL/ Plant Gnome	1,450	1,450	1,450	1,450	1,450	1,450	8,700
Total Costs	24,360	26,680	27,162	28,070	28,370	28,759	$163,401
Staff Years:	140	140	140	140	140	140	840

12. USDA IRM Implementation Framework Area Supported:

Business/Customer Support
Information and Data Management

1. **Objective 0-9: Radio System**

2. Status: New

3. Objective Statement:

   REE will modernize its radio systems to effectively support the radio traffic requirements and to comply with congressional and national radio usage policy.

4. Strategy:

   AFM has initiated a radio system modernization program to coincide with congressional mandated changes to radio spectrum policy. AFM/AITD will gather data and analyze the various types of radios used throughout REE. Based on the number of existing radios, a projected cost will be derived. Once this is accomplished all area/location offices will be prioritized for system upgrades over the next eight years.

5. Program(s) Supported: All ARS programs are supported by this objective.

6. Cross-Cutting or Interagency Program Supported:

   All Interagency Programs supported by ARS are supported by this objective.

7. Background:

   Radio spectrum usage is operating with changes in policy and equipment technologies. Due to these changes it has been mandated by Congress that Federal Government utilize the radio spectrum more efficiently. To comply with the mandate, all frequency modulated land mobile radios, must be replaced and comply with the new policy by FY 2005.

8. Contact: Steve Garvin
   Phone: 301-344-2872
   Administrative Information and Technology Division, Greenbelt, MD

9. Major Milestones.

   A major data gathering project will take place during fourth quarter 1995 and will be completed by the end of first quarter 1996. Once the data gathering is completed, ARS will have a better understanding of what radio equipment resources are required and what the financial impact will be over the next 10 years.

Objective 0-9: Radio System (Continued)

10. Resources:

The initial data gathering will be accomplished with input from the Area Property Officers and Location Administrative Officers. The data analysis will be undertaken by the Agency frequency manager.

11. Acquisition Description:

Radio equipment acquisitions and/or upgrades will be specified once estimated costs are projected from the data analysis stage of this objective.

1. Objective 0-10: Implementation of a Relational Database and Graphical User Interface Development Software.

2. Status. New.

3. Objective Statement.

ARS will implement a new relational database and Graphical User Interface (GUI) development platform capable of handling enterprise-wide systems across a Wide Area Network.

4. Strategy.

ARS researched, evaluated, and benchmarked various relational databases and GUI development products to determine which platform would best meet ARS' needs for enterprise-wide applications now and into the future.

Once the analysis of the various products is completed, a recommendation will be made for the purchase of the necessary hardware, software, and training. An implementation plan will be developed to gradually move the whole agency to the new platform taking into consideration the needs in the various ARS area offices.

5. Program(s) Supported.

The relational database and GUI development software will be used for administrative systems developed to support the administrative needs of the Research, Education, and Economics agencies.

6. Cross-Cutting or Interagency Program Supported:

This new database and development software will support the administrative information needs of the Research, Education, and Economics agencies and interface, where appropriate, with Departmental systems.

7. Background.

ARS currently uses PROGRESS as the relational database with a mixture of development tools which includes, but is not restricted to Microsoft Access and Visual Basic. We also continue to support systems developed for the dBase database structure and written in dBase and Clipper. Recognizing our need to support larger databases and applications with more users over a Wide Area Network, we began an analysis to determine the best development platform for our future systems. This

Objective 0-10: Implementation of a Relational Database and Graphical User Interface Development Software. (Continued)

analysis lead us the realization that PROGRESS should not be the relational database for our future because of inherent limitations.

8. Contact: Janet Nolton
Phone: 202-720-4789
Administrative Information and Technology Division, Washington, D.C.

Objective 0-10: Implementation of a Relational Database and Graphical User Interface Development Software. (Continued)

9. Major Milestones.

Activity	Planned Start Date (Quarter)	End Date (Quarter)	Actual End Date (Quarter)
Identify requirements for GUI development software and relational database	3/95	4/95	4/95
Research & evaluate products	4/95	1/96	1/96
Benchmark final products	2/96	2/96	3/96
Recommend acquisitions necessary for GUI development software and relational database	2/96	2/96	3/96
Develop requirements for WAN & LAN implementation	2/96	4/96	
Install relational database & GUI development software at headquarters	3/96	4/96	
Develop implementation plan for installation of relational database in areas	3/96	4/96	
Implement first administrative system, REE Locator, on with new relational database and GUI development software	2/97	3/97	

Objective 0-10: Implementation of a Relational Database and Graphical User Interface Development Software. (Continued)

10. Resources.

thru Total	FY96	FY97	FY98	FY99	FY00	FY01	Total
Costs($000)	100	25	25	25	14	14	203
Staff Years	2.0	2.0	1.0	1.0	1.0	1.0	8.0

11. Acquisition Description.

For this objective, ARS will be acquiring software for a new relational database to support 100 concurrent users, technical support and upgrades for the relational database, training for a database administrator, GUI development software for the development staff, training for the development staff, and technical support and upgrades for the development software. In the out years, ARS will be acquiring continuing technical support and upgrades for the relational database and the GUI development software. Additionally, as our database usage expands we may add more concurrent users.

12. Departmental IRM Implementation Framework Area Supported:

Agricultural Research Service
Research, Education, and Economics agencies

CHAPTER II

National Agricultural Library (NAL)

National Agricultural Library
Agricultural Research Service
IRM Long-Range Plan
FY 1997 - FY 2001

A. NATIONAL AGRICULTURAL LIBRARY AND IRM PLAN OVERVIEW

1. Introduction:

a. Organization Overview:

The National Agricultural Library (NAL) serves as the nation's chief agricultural information resource. It provides agricultural information, products and services to Agencies of the USDA and to public and private organizations, and individuals. NAL coordinates a national network of public and private agricultural libraries and information centers, especially with libraries of the land grant colleges and universities, and other State supported colleges and universities with agriculturally related programs, other public organizations, and industry and other private sector organizations.

NAL ensures the acquisition, organization (including cataloging and indexing), management, preservation, accessibility, and diffusion of information in all phases of the agricultural and allied sciences, as set forth in Title XIV of the Food and Agriculture Acts of 1977 and 1981. A significant part of this mission is the development and coordination of a national agricultural science information network. The Library provides leadership for the management of agricultural information resources through products and services, including bibliographies, loans, photocopies, microforms, structured agricultural thesauri, computerized database repositories, indexing of agricultural information, and personal reference services including online computerized literature searches.

NAL works closely with USDA Agencies, coordinates activities with the other three national libraries: the National Library of Medicine (NLM); the Library of Congress (LC); and the National Library of Education (NLE). NAL also cooperates with other groups in both the public and private sectors, to ensure that the results of research and other types of agricultural information are rapidly disseminated to the ultimate user. NAL promotes the use of modern technology in support of library and information activities.

NAL provides a leadership role in U.S. participation in international agricultural library and information systems and in efforts to promote worldwide availability of

agricultural information. In addition, the NAL serves as the Nation's major source of agricultural information received from and relayed to other countries, as the agricultural information liaison to international organizations and organizations outside of the United States, and as the U.S. agricultural representative in the setting of library and information standards internationally.

The Library was instrumental in forming, and works closely with the United States Agricultural Information Network (USAIN), an organization developed to provide a national forum through which agricultural librarians and information specialists might address the many issues associated with the collection, access, preservation, and delivery of agricultural information in the 1990's.

The National Agricultural Library is located in Beltsville, Maryland, with a Reference Center in downtown Washington. The Library has no official field offices but maintains close relationships with all USDA Agency libraries and the land grant library community. NAL is staffed by about 230 professionals, non-professionals, and clerical. In the broadest sense, all of these people are related to IRM since the mission of the Library is the collection, control, and dissemination of information.

The attached organizational chart shows the NAL structure. The Office of the Director is responsible for providing leadership and direction in accomplishing NAL's mission. The Technical Services Division is responsible for the acquisition, organization, and preparation of library materials. The Public Services Division is responsible for reference service, information center operation, document delivery, and collection maintenance. The Information Systems Division is responsible for the organization and delivery of technical information through library automated systems, and for developing new technology applications for the Library. Although current reorganization plans provide for the consolidation of administrative functions performed within the NAL Office of the Administrative Manager, no definitive

b. NAL's IRM Program

Technical program-related IRM support at the NAL is provided by the Information Systems Division, which has broad responsibility for all automation activities at NAL. The information Systems Division consists of a staff of approximately 30 people organized into three functional units: the Office of the Associate Director for Automation, the Library Automation Branch, and the Database Administration Branch. The mission and goals of the Division are as follows:

MISSION

To develop and provide automated services, programs and products that facilitate access to and utilization of information; and to provide technical leadership in utilizing new technologies for information delivery.

GOALS

1. To provide timely and effective service in the maintenance of production databases.

2. To provide timely and effective Current Awareness Literature Service.

3. To provide automation support for all NAL units.

4. To facilitate the development and use of new technologies for information delivery.

5. To administer and manage the above activities in an efficient and effective manner.

2. IRM Planning Process

The IRM planning process at the National Agricultural Library is a continuing process. Being responsive to executive and legislative initiatives is a key focus in such planning. The annual call for the Agency IRM Long Range Plan gives an opportunity to coordinate and consolidate the on-going planning activities.

The IRM planning process includes linkages to Agency budget and program planning. Information collected during the planning process is used for both the IRM Long Range Plan and the Agency budget submittal, thus ensuring that these documents are consistent and reflect the most current Agency planning activities.

Approval for IRM initiatives and resource requests within NAL is obtained from the senior management team. Proposals for new initiatives and major enhancements to ongoing programs are reviewed and evaluated against Departmental goals and executive and legislative programs.

Final decisions are made based on effectiveness of proposals in meeting needs in high-priority program areas.

NAL has an emphasis on interagency programs, which includes coordination and initiation of joint programs with agencies under the supervision of the Under Secretary of Agriculture for Research, Education, and Economics as well agencies under the supervision of the other Under Secretaries.

3. Current IRM Environment

NAL has completed the procurement and installation of a major upgrade of its minicomputer-based turnkey integrated library system (ISIS) which supports the current library functions and maintaining and enhancing the AGRICOLA bibliographic database, which contains more than 3 million citations related to agriculture and the relevant subsets of its related sciences.

Microcomputer workstations have replaced terminals for use by NAL reference staff and NAL patrons to support online searching of a variety of database services as well as local searching of CD-ROM databases. Access to NAL's ISIS bibliographic database is now provided through the NAL Internet World Wide Web as well as via the Internet Telnet protocol.

Electronic mail systems on FTS2000MAIL as well as on the Internet are available for use by library staff. Requests for material are received from libraries both nationally and internationally over these systems. NAL staff are also in communication with land grant libraries, researchers, automation specialists, and many others through these mail services.

NAL continues a number of projects utilizing optical technologies for information storage and dissemination. Optical scanning, optical character recognition, and optical storage are being used to capture, store, and disseminate textual agricultural material to the land grant community. Graphic materials such as photographs, prints, posters, and film strips are also being stored on optical media for more effective storage and dissemination.

Other technology applications include hypertext and expert systems to enhance access to aquaculture information and training for the application of pesticides. Optical scanning and text recognition is now part of the indexing operation and enables staff to include abstracts in the AGRICOLA database at four times the previous rate. In addition, automated training of catalogers is a distinct possibility for the future with a cataloging training prototype developed at NAL.

4. Accomplishments

NAL IRM initiatives have contributed significantly to the success achieved in applying current and emerging technology to enhance library operations as well as to achieve the USDA objective to increase information sharing throughout the agricultural community. In addition to the technological enhancements previously outlined with respect to NAL's current IRM environment, the benefits of NAL IRM initiatives can be seen as initiatives transition to operational status.

Significant progress was made in enhancing production operations of ISIS (Integrated System for Information Services). NAL now produces and issues the sale tapes for its AGRICOLA database through ISIS, which will result in significant cost savings. The Acquisitions and Serials Branch also began ordering monographs electronically from two of its commercial

book vendors. Similar capabilities are being explored with other book vendors. In 1994, NAL began exporting records from the National Arboretum electronically as they are created instead of tapeloading them on a semi-annual basis, which enables NAL to make these records available to ISIS users six months earlier than previously achieved.

NAL has continued to increase its Internet presence, both within the library and worldwide. NAL established a gopher server in August 1994 and a World Wide Web server in April 1995. Electronic documents, images, databases, and other information continue to be loaded and updated on the NAL Internet-accessible servers on a regular basis. NAL set up its own USENET news server in January 1995, including the establishment of several local news groups covering topics of interest to NAL employees. NAL also set up an automated system to administer several Internet electronic mail lists, including Mealtalk and Pavnet. In February 1996, NAL made ISIS, its on-line catalog, available on the Internet.

NAL also recently upgraded its access to OCLC. An X.25 connection, accessible to all NAL staff, was set up, allowing the library to eliminate nearly all of its dedicated OCLC workstations and generating significant savings in maintenance and communications line costs.

NAL's National Agricultural Text Digitizing Program (NATDP) is fully operational. The NATDP was a cooperative effort between NAL and 42 land-grant university libraries to test a method of capturing full-text and images in digital format for publication on CD-ROM discs. This program, and its expansion to include additional land-grant library participation, will contribute toward USDA objectives to maximize opportunities to share information and toward providing a technological environment to support program delivery.

A related initiative derived from the successful completion of the NATDP Pilot Project has been put into production supporting NAL's document delivery service. The installation of a *Ariel* system workstation has enabled NAL to facilitate electronic delivery of documents to Ariel Sites throughout the United States, Canada, Australia, Hong Kong, the United Kingdom, and several Scandinavian countries. Additional workstations will be added to capitalize on the benefits that can be achieved through use of this system.

NAL was engaged in a number of other cooperative projects, such as the Plant Genome Project, which involve the creation of information databases which are greatly benefiting researchers as well as the entire agricultural community. The USDA National Genetics Resources Program is a cooperative effort of the Agricultural Research Service (ARS), the Cooperative State Research, Education, and Extension Service (CSREES), and NAL to incorporate germplasm conservation and five genome research programs (plant, tree, animal, insect and microorganisms). NAL has management responsibility for the data and information component of the program gathered from the genome research programs and the international community at large and stored in a master database. Cooperators inside and outside of USDA have been engaged in the database design efforts and are coordinating the

capture and evaluation of genetic information. The major target user groups are plant breeders and molecular geneticists.

The Agricultural Genome Information Server (AGIS) has evolved from the design and development stage to full production being accessed more than 200,000 times a month from users in 70 countries. The database now consists of 10 Gigabytes of genome data which has been uploaded from about 20 collaborative genome databases and 15 ancillary databases that range from bibliographic reference databases to plant chemicals and germplasm. and relevant bibliographic data from AGRICOLA. It contains a wide variety of genomic data including information about maps (genetic, physical, etc.), sites (mappable objects such as genes), variations of sites (e.g., mutations and alleles), phenotypic traits, probes, gene products, and germplasm. The database is being expanded to include data from solanaceous crop plants, rice, cotton and ultimately all of approximately 70 important crop commodities.

Interactive access to AGIS is provided via the Internet and modem dial-up service. The data and information are is presently made available on NAL's Agricultural Genome Gopher Server and NAL's Agricultural Genome World Wide Web Server. The data can also be accessed via automated responses to electronic mail queries. The database provides links to other relevant databases such as DNA and protein sequence databases, and ARS's GRIN (Germplasm Resources Information Network). Two CD-ROM's of the database have been released and more are planned.

In December, 1995 NAL established a second world wide web site for the Agricultural Network Information Center (AgNIC). AgNIC is a distributed network that will provide electronic access to people, agricultural information, and other resources over the Internet. An AgNIC pilot was implemented by NAL in collaboration with several land-grant universities to share resources while facilitating access to and retrieval from these resources. The unique aspect of AgNIC is that it is one of the first subject-oriented network Information Centers (NICs) that will help Internet users cope with the vast quantity of agriculture-related information that is available from widely-dispersed sites by providing a single focal point from which the resources can be found. Although the focus of the AgNIC prototype is on agriculture, the principal could be applied to any discipline.

5. Future Direction

The United States Congress has established a number of mandates for NAL. Most notable is a charge to serve as the primary agricultural resource of the United States. This, in effect, provides NAL a specific legislative mandate to serve as the National Agricultural Library.

Specifically mandated activities include:

- Organize agricultural information and information products and services by cataloging, indexing, bibliographic listing, and other appropriate techniques.

- Provide agricultural information and information products and services to agencies of the Department of Agriculture and the Federal Government, public and private organizations, and individuals, within the United States and internationally.

- Plan for, coordinate, and evaluate information and library needs related to agricultural research and education.

- Cooperate with and coordinate efforts among agricultural college and university libraries, in conjunction with private industry and other agricultural library and information centers,toward the development of a comprehensive agricultural library and information network.

- Coordinate the development of specialized subject information services among the agricultural and library information communities.

- Provide for a repository of agriculture and ground water quality planning information.

- Support Department water programs through participation in State water quality coordination programs and dissemination of agrichemical information.

- Represent the Department on the National Sustainable Agriculture Advisory Council.

- Disseminate information on materials and methods of pest and disease control available to agricultural producers through the pest and disease control database.

- Provide for resource information concerning rural electric and telephone use and development efforts.

- Act as a catalyst for providing access to leadership training and services programs encompassing private, public, business, and government entities in cooperation with the Extension Service.

- The National Rural Information Center Clearinghouse will provide and distribute information and data about Federal, State, local and other rural development assistance programs and services available to individuals and organizations. To the extent possible, the NAL shall use telecommunications technology to disseminate information to rural areas.

- NAL shall provide for the dissemination of appropriate rural health and safety information resources possessed by the NAL Rural Information Center, in cooperation with State educational program efforts.

In the next few years, NAL expects to continue to expand its use of technology in pursuit of the above-mentioned activities as well as to improve control, access, and dissemination of agricultural information to the national and international agricultural communities.

NAL has completed Phase II of a major three-phase planning effort which focused on the issues related to electronic information management and the policies and procedures required to address these issues related to the management of electronic information as NAL moves to improve its capability to meet its legislated mandate to enhance access to agricultural information. The thrust of the initiative is to implement a program aimed at achieving an effective transition from information services using a traditional, print collection to providing electronic access to information via the Internet as part of the National Information Initiative (NII). The EII will create the infrastructure required to ensure that NAL will have the capacity to function in this newly created environment, in which the instantaneous transmission of information worldwide is fast evolving as the standard.

The access and distribution portion of the EII involved establishing a prototype Agricultural Network Information Center (AgNIC). The pilot project is being done in cooperation with selected land grant universities, USDA agencies in the Research, Education, and Economics community. The pilot project will experiment with the concept of operating a discipline-oriented distributed network information center on the Internet which will enhance electronic access to agriculture-related information people and other resources. Enhancements to the ISIS integrated library system will include full implementation of the 3 million record AGRICOLA database. Enhanced telecommunications facilities will provide the capability to deliver this information to agencies and institutions worldwide. This will be a new advance in resource sharing. Advances in optical storage capacity and optical character recognition will make it feasible to supply not just bibliographic information but content as well in machine form to both local and remote users. The miniaturization of the NAL collections will provide better access to materials, reduce the space required for storage, and facilitate efforts to preserve selected collections.

NAL staff members chair or serve as active members in USDA intra-agency, inter-agency, national and international standards committees within and outside the library community to develop and influence the evolution of standards. NAL uses the United States Machine Readable Cataloging (USMARC) national standard for bibliographic formats to catalog records in the NAL bibliographic database and is participating in an international effort to develop a Unified Agricultural Thesaurus (UAT) with international standards for agricultural terminology. Other standards committees in which NAL participates are dealing with issues on the management, storage, retrieval and transmission of electronic information, images, and related source data.

B. NATIONAL AGRICULTURAL LIBRARY (NAL) IRM OBJECTIVES

1. Objective Title: Integrated System for Information Services (ISIS), Objective Number 1.

2. Status: Continuing (C).

3. Objective Statement: To automate all principal library functions at the NAL with system enhancements to support networking with land grant libraries.

4. Strategy: Develop and install an integrated automated library system, with contractor assistance, to automate the functions identified below on a phased basis. A key component of the strategy is to evaluate the system's effectiveness in relation to NAL's mission, present information needs, and future information requirements.

a. Online catalog
b. Acquisitions control
c. Circulation control. Inventory and production control capabilities would be provided or developed at a later date.
d. Data entry (cataloging and indexing). Capability for data entry from remote locations would be provided.
e. Serials control

5. Program(s) Supported: This initiative has enhanced the efficiency and effectiveness of library operations, improved access to essential agricultural information by researchers and other users within and outside the USDA, and expanded NAL's capability to share information throughout the world in a timely and responsive manner.

6. Cross-Cutting or Interagency Program Supported: This initiative directly supports USDA IRM objectives to integrate IRM and program planning, maximize information sharing, and use technology to support program delivery.

7. Background: For many years, NAL used a minicomputer to do only data entry for indexing. Other library functions were maintained in batch system at the departmental computer center, including the maintenance of a machine-readable catalog master file. Integrating all of these functions into one system is improving the productivity of NAL staff members by putting NAL's principal files into an online system in support of interdependent functions identified in item 4, above. In May 1992, NAL installed a new HP minicomputer to provide the computer capacity required. This began a new ISIS system life cycle.

8. Contact Name, organization, and Phone Number:

a. Claudia V. Weston
b. National Agricultural Library, Information Systems Division
c. Phone: (301) 504-6813

9. Major Milestones

	Planned Start Date	Planned End Date	Actual End Date
a. Implement Indexing	05/92	12/93	10/93
b. Implement AGRICOLA tape processing	05/92	12/93	10/93
c. Implement title authority	03/93	12/93	06/93
d. Implement Circulation	12/93	12/94	
e. Implement Electronic ordering	12/93	12/94	
f. USDA Internet access to ISIS	06/94	06/95	
g. Evaluate current system effectiveness	06/94	12/94	
h. Analyze alternatives	12/94	06/95	

10. Resources:

Fiscal Years	Thru FY96	FY97	FY98	FY99	FY00	FY01	FY02+	Total
a. Total Costs ($000)	2089	548	590	485	505	515	525	3168
b. Staff Years	3	3	3	3	3	3	3	24

11. Acquisition Description: Acquisition of new upgraded minicomputer with capability to support the processing requirements of the system.

12. Departmental IRM Implementation Framework Area Supported: Information and data management.

1. Objective Title: Electronic Information Initiative (EII), Objective Number 2.

2. Status: Continuing (C).

3. Objective Statement: To begin to create the infrastructure necessary to establish NAL as the central node in an electronic system, providing agricultural information by directly linking users with the information producers. To use advanced technologies to store, preserve, retrieve, and disseminate full text, bibliographic and image information. To develop an information network using improved information delivery systems to serve the agricultural community.

4. Strategy: Installing and maintaining an appropriate hardware/software platform to allow NAL staff to take maximum possible advantage of the NAL Internet connection is one area of concentration in the network-based agricultural information program NAL is developing. The NAL will be fully wired for network connectivity and Internet-connected servers and corresponding clients will be established to support the dissemination of electronic agricultural information. A computer system within NAL will be developed to provide access to AGRICOLA, plant genome databases, other research and bibliographic databases as well as electronic texts and journal archives. NAL will be established as a USDA gateway. Multiple use graphical workstations will be purchased to access and process data in a wide variety of electronic formats. Critical agricultural electronic information resources will be identified; many of those rated highest will be purchased or licensed. Increased technical competence and awareness of NAL staff with respect to use of network resources is another key component. Full text databases are supported by online or optical information storage and retrieval systems which contain the full text (entire textual content) written information. Once the information is stored in its entirety, it can be indexed and analyzed at a much more detailed level; and it can be accessed (i.e., "delivered") over the phone lines via remote terminals, or through local microcomputer systems. This has extensive and significant implications for the cost, effectiveness, speed, reliability, and user satisfaction of current document acquisition, analysis and delivery systems.

Multi-faceted approaches will be used to evaluate ways to add value to existing information, to include the use of the Standard Generalized Mark-up Language (SGML) for identification of machine readable documents and hyper text links to interconnect complex concepts. Locating techniques include concept searching, neural-net searching and intelligent query search agents.

Another key component in the Initiative is the creation of an Internet-based Agricultural Network Information Center (AgNIC). The AgNIC will provide a wide range of agricultural information in a variety of digital forms, such as databases, computer programs, datafiles, electronic journals, etc., to both the NAL staff and the broader agricultural community.

The final element will extend networking knowledge and expertise to other organizations with which NAL cooperates, so that they may also take full advantage of the AgNIC and other network resources. In addition, FTS2000 S.25 service will be used to provide access to NAL systems and to access external information systems whenever appropriate.

5. Program(s) supported: This Initiative supports NAL programs related to its mission to organize, store, and improve access to agricultural information and to coordinate with private industry and agricultural college and universities and others to develop a comprehensive agricultural network. This Initiative will significantly enhance access to agricultural information for NAL staff, other USDA agencies, the Land Grant University system by providing and facilitating access to digital library

materials and by providing the technological tools that underpin the ability to work successfully in a digital environment.

6. Cross-Cutting or Interagency Program Supported: This initiative supports USDA IRM objectives to maximize information sharing, to integrate IRM and program planning and to use technology to support program delivery.

7. Background: The National Agricultural Library has the primary responsibility within USDA for acquisition, organization, and delivery of agricultural information. Historically, this information has been acquired and delivered in its printed or published form. Since 1862, NAL has been making printed information available for loan or on-site use; and more recently, NAL has offered "photocopy-in-lieu of loan" for printed material. Each year over 250,000 requests are received for items in the NAL collection, or those of its Regional Document Delivery System. As an organization with responsibility for delivering such large quantities of information, NAL is interested in, and responsible for, the development of alternative document acquisition and delivery systems. Toward this end, NAL has been studying the development of electronic "full text" databases, document acquisition and delivery mechanisms and programs to improve end-user access to information through value-added processing and improved access mechanisms.

The emergence of the Internet and its related computer networks as a preeminent vehicle for the sharing of scholarly information provides a great challenge for libraries. In their traditional role of information providers, libraries have relied mainly on systems designed around paper as the primary medium for the delivery of information. The emergence of computer networks and the appearance of digital information its many forms demand that libraries modify existing systems and build new ones that will meet the exigencies of the digital age. As one of the three U.S. National Libraries, NAL must take the lead in the planning, design, and creation of such systems. As the preeminent U.S. agricultural library, NAL must have the ability to efficiently perform its identification, collection, dissemination, and archiving responsibilities \when dealing with materials in a wide variety of electronic formats. This initiative supports these goals.

8. Contact Name and Phone number:

a. Carol Ditzler
b. National Agricultural Library
c. Document Delivery Services Branch, Public Services Division
4. (301) 504-6503

9. Major Milestones:

	Planned Start Date	Planned End Date	Actual End Date
a. Complete extension of TCP/IP network throughout NAL	10/94	12/94	12/94
b. Establish CD-ROM networked access	10/95	12/96	

c. Establish USDA CI connectivity redundancy via NAL/FIX-East	12/94	6/95	Cancelled
d. Establish NAL NIDR servers (Gopher,WWW)	10/94	4/95	
e. Networked AGRICOLA for NAL staff	12/94	9/96	
f. Produce NAL publications in electronic form	1/95	12/97	
g. Evaluate use of SGML to effectively access electronic documents	11/94	12/96	
h. Establish Electronic Media Center	10/94	9/95	
i. Implement AgNIC Pilot	05/95	9/99	9/95

10. Resources:

	Thru FY96	FY97	FY98	FY99	FY00	FY01	FY02+	Total
a. Total Costs ($000)	962	1500	1500	1500	1500	1730	1730	10422
b. Staff Years	3	3	5	5	5	5	5	28

11. Acquisition Description: Telecommunications, applications software, and multimedia workstations. This initiative includes multiple short-term and other evaluations of technology not involving computer systems. The initiatives do not involve a specific system and do not have a system life cycle.

Equipment and services to be acquired under this initiative will include Internet access service, networking hardware and firmware, UNIX workstations, and database software. Contracting costs are not expected to expected to exceed $5 million during fiscal years 1995-1999.

12. Departmental IRM Implementation Framework Area Supported: Information and data management, Business/Customer Support, Application Information Systems, and Delivery System.

1. Objective Title: NAL Preservation and Storage Program, Objective Number 4

2. Status: Revised (R).

3. Objective Statement: To establish a Storage and Preservation Program to miniaturize and preserve the NAL's irreplaceable agricultural documents that are of significant interest to USDA, the agricultural scientific community, and the nation; and to provide a solution to the problem of adequate storage space.

4. Strategy: Several preservation and storage methodologies are being used to address the space problem the NAL is experiencing. One key methodology involves accelerating the development of electronic miniaturization storage and preservation technologies, which allow discarding of the original printed material while preserving the information content.

5. Program(s) Supported: This initiative will safeguard essential agricultural information to ensure future access by researchers and other users in the USDA, the land-grant system, and elsewhere.

6. Cross-cutting or Interagency Program Supported: This initiative directly supports USDA IRM objectives to integrate IRM and program planning and to use technology to support program delivery.

7. Background: It is widely recognized that the NAL collection constitutes an irreplaceable resource treasure for USDA, the nation, and the international agricultural scientific community. In addition to its broad coverage of agricultural topics, NAL's collection includes a wealth of unique information including original manuscripts; archival material; rare books; photo collection images and slides; maps; historical posters; botanical art, audio-visual material; oral histories; and one of the largest nursery and seed trade catalog collections in the world. The shelving space available for housing this collection in the Beltsville, Maryland, building is near capacity. A recent space utilization rate study predicted that NAL would run out of stack space for books and journals in FY 95. Parts of the collection are also deteriorating as they age, due to the widespread use of acidic paper for printing in the second half of the 19th and first half of the 20th centuries. It is possible to both miniaturize and preserve parts of the collection by digitizing the publications. This method can also provide increased and more timely access to the publication through the use of electronic document delivery, CD-ROM technology, or the Internet.

8. Contact Name, Organization and Phone Number:

a. Judith A. Zidar
b. National Agricultural Library, Information Systems Division
c. Phone: (301) 504-6813

9. Major Milestones:

	Planned Start Date	Planned End Date	Actual End Date
a. Recruit Preservation Officer	03/96	12/96	

b. Evaluate, copy, catalog, and properly store NAL microfilm holdings	10/95	12/08	
c. Develop selection criteria for electronic preservation of Federal and pre-1862 documents not already on microfilm.	7/95	10/95	11/95
d. Develop electronic storage and access requirements for an archiving system	12/95	09/97	
e. Select documents for electronic preservation	03/96	12/99	
f. Digitize selected documents, either in-house or outsource.	07/96	12/01	
g. Store digitized documents on archiving system	01/97	03/02	
h. Develop National Agricultural Literature Archive (original, microform, digital)	09/97	09/98	
i. Acquire and conserve critical materials for the NAL collection	02/96	12/01	

10. Resources:

	Thru FY96	FY97	FY98	FY99	FY00	FY01	FY02+	Total
a. Total Cost	500	750	750	950	950	1150	1150	6200
b. Staff Years	3.3	4.5	4.5	5.5	5.5	5.5	5.5	34.3

11. Acquisition Description: Commercial services contract for miniaturization and book storage facility.

12. Departmental IRM Implementation Framework Area Supported: Information and data management.

EPARTMENT OF AGRICULTURE

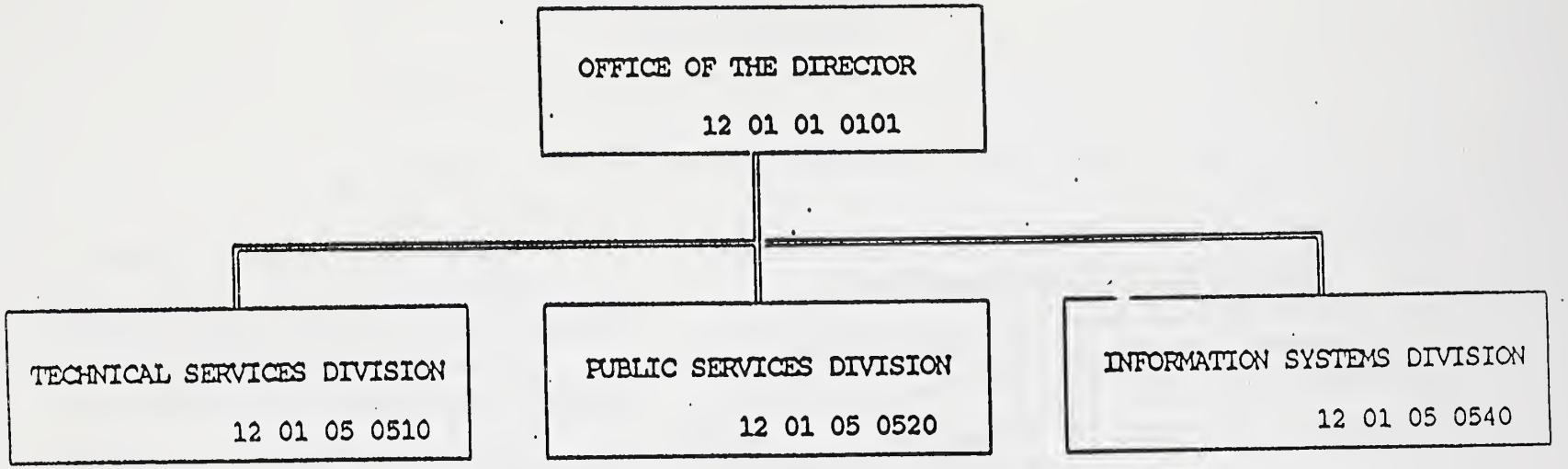
NATIONAL AGRICULTURAL LIBRARY

RECOMMENDED: Joseph H Howard
Director, National Agricultural Library

CONCUR: Charles E. Hess
Assistant Secretary, Science and Education

APPROVED: Adis M. Vila 8/27/90
Assistant Secretary for Administration

DATE: AUG 28 1990



MISSION: The National Agricultural Library (NAL) serves as the Nation's chief Agricultural Information resource. It provides agricultural information products and services through traditional library functions and through modern electronic dissemination to agencies of the USDA, public organizations, and individuals. The NAL coordinates a national network of public and private libraries consisting of the land-grant colleges and universities, other state supported colleges and universities, other state supported colleges and universities with agriculturally related programs, other public organizations, industry, and other private sector organizations. The NAL provides a leadership role in U.S. participation in international agricultural library and information systems and in efforts to promote worldwide availability of agricultural information.

ades chart dated January 29, 1988

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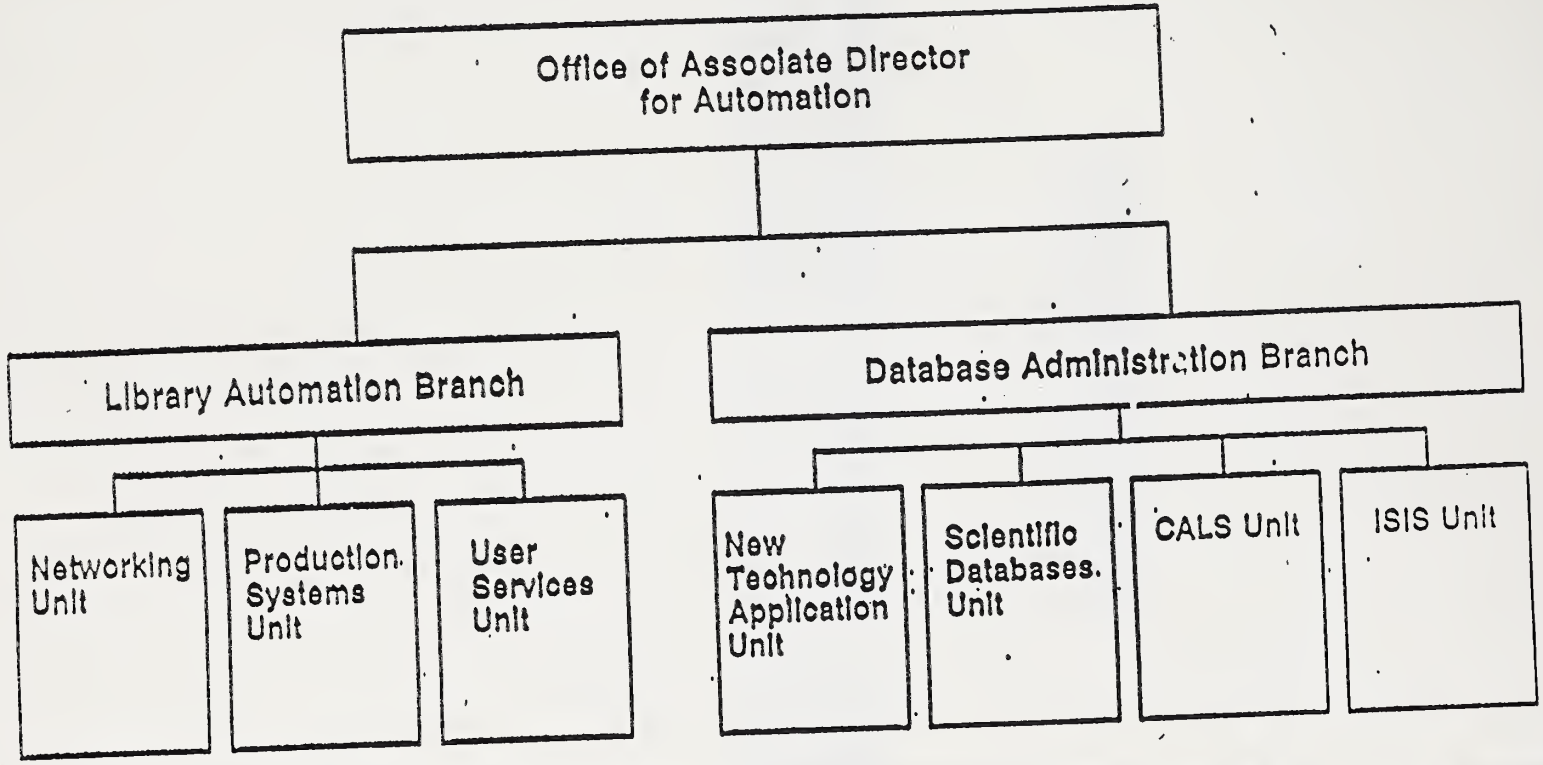
s Branch, Personnel Division, ARS

Information Systems Division Organization



CHAPTER III

Cooperative State Research, Education, and Extension Service (CSREES)

Cooperative State Research, Education, and Extension Service
Information Resource Management Plan

FY 1997 - FY 2001

A. Agency and IRM Plan Overview

1. Introduction and Background

The new Cooperative State Research, Education, and Extension Service (CSREES) is positioned for the 21st century as a dynamic change agent and international research and education network. CSREES expands the research and higher education functions of the former Cooperative State Research Service and the education and outreach functions of the former Extension Service. The result is better customer service and an enhanced ability to respond to national priorities.

CSREES links the research and education programs of the U.S. Department of Agriculture and works with:

- Land-grant institutions in each state, territory and the District of Columbia;
- More than 130 colleges of agriculture;
- 59 agricultural experiment stations;
- 57 cooperative extension services;
- 63 schools of forestry;
- 16 1890 historically black land-grant institutions and Tuskegee University;
- 27 colleges of veterinary medicine;
- 42 schools and colleges of family and consumer sciences;
- 29 1994 Native American land-grant institutions;
- 127 Hispanic-Serving Institutions, including 81 members and 45 associate members of the Hispanic Association of Colleges and Universities.

Mission

In cooperation with our partners and customers, CSREES provides the focus to advance a global system of research, extension and higher education in the food and agricultural sciences and related environmental and human sciences to benefit people, communities, and the Nation. The CSREES mission emphasizes partnerships with the public and private sectors to maximize the effectiveness of limited resources. CSREES programs increase and provide access to scientific knowledge; strengthen the capabilities of land-grant and other institutions in research, extension and higher education; increase access to and use of improved communication and network systems; and promote informed decision making by producers, families, communities, and other customers.

Focus

The heart of the CSREES results-oriented vision is to improve economic, environmental, and social conditions in the United States and globally. These conditions include improved agricultural and other economic enterprises; safer, cleaner water, food, and air; enhanced stewardship and management of natural resources; healthier, more responsible and more productive individuals, families and communities; and a stable, secure, diverse and affordable national food supply.

Programs

CSREES research, extension and education leadership is provided through programs in Plant and Animal Production, Protection, and Processing; Natural Resources and Environment; Rural, Economic and Social Development; and Families, 4-H, and Nutrition; Partnerships; Competitive Research Grants and Awards Management; Science and Education Resources Development; and Communications, Technology, and Distance Education.

The CSREES partnership with the land-grant universities and their representatives is critical to the effective shared planning, delivery, and accountability for research, higher education and extension programs.

Advanced Communication Technology

CSREES is a recognized international leader in the design, organization and application of advanced communication technologies and in meeting the growing demand for enhanced distance education capabilities. CSREES provides essential community access to research and education knowledge and connects the private citizen to other federal government information. All state extension system offices and 75 percent of county offices are interconnected via interactive communication technology. This capability enables CSREES to respond in a timely and credible manner to critical issues and public needs.

Reaching Diverse Audiences

Rural America is more diverse, both in human and financial resources, than ever before in our history. This diversity is vital to the CSREES mission to better serve our customers. CSREES is a diverse and multicultural organization that values and is committed to pluralism as a long-term investment in the future.

Making a Difference

CSREES focuses on critical issues affecting people's daily lives and the Nation's future. Advanced research and educational technologies empower people and communities to solve problems and improve their lives. CSREES responds to predominant quality of life problems -- improving agricultural productivity, creating new products, protecting animal and plant health, promoting human nutrition and health, strengthening children, youth and families, and revitalizing rural American communities. We accomplish this through strategic planning and the development of research and education programs in cooperation with our partners.

CSREES at Work

CSREES is the foundation for knowledge-based agriculture with its critical connection between extension educators identifying and communicating agricultural, environmental and community problems to the researchers back on campus and at the experiment stations. The generation of new knowledge serves to develop the next generation of scientists. Together they initiate and stimulate new research that provides the solutions to real world problems.

CSREES is

- Cutting edge research programs on value-added product development, plant and animal genome, integrated pest management, water quality, human nutrition, food safety, and animal and plant systems;
- Model education programs on food safety, sustainable agriculture, water quality, children, youth and families, health, environmental stewardship, and community economic development;
- 5.6 million youth involved in 4-H projects and programs;
- The National Research Initiative which supports research to solve key agricultural and environmental problems;
- Grants to provide agricultural and food sciences educational opportunities in professions where jobs outpace graduates by over 11 percent;
- Innovative design and development of interactive distance education activities to reach diverse audiences and sustain access to lifelong learning;
- Immediate electronic access to vital flood and disaster safety and recovery information;
- 3 million trained volunteers who work with outreach education programs nationwide;
- Over 9,600 local extension agents working in 3,150 counties;

- Over 9,500 scientists conducting research at 59 state agricultural experiment stations;
- Farm safety education programs in all 50 states and Puerto Rico;
- Pesticide applicator programs which train over half a million people each year in safe and environmentally sound pesticide use;
- International education programs taught by over 200 extension professionals in 17 countries.

For Further Information

Contact your local county extension office (offices are listed under local government in the telephone directory), a land-grant university or the Cooperative State Research, Education and Extension Service, U.S. Department of Agriculture, Washington, D.C. 20250-0900. Telephone: 202-720-3029; Fax: 202-690-0289; or contact via Electronic Mail: csrees@reeusda.gov

You may also access us via the Internet:

World Wide Web: http://www.reeusda.gov

Agency IRM Program

The Administrator's Executive Staff functions as the IRM Review Board. It consists of the Administrator, Associate Administrator, Deputy Administrator for Communications, Technology, and Distance Education, Deputy Administrator--Competitive Grants and Awards Management, Deputy Administrator for Families, 4-H, and Nutrition, Deputy Administrator for Plant and Animal Production, Protection, and Processing, Deputy Administrator for Partnerships, Deputy Administrator for Natural Resources and Environment, Deputy Administrator for Rural, Economic, and Social Development, Deputy Administrator for Science and Education Resources Development, Director of Civil Rights, Director of Legislative Affairs, and the Budget Director.

The Team Leader for Information Technology, with guidance from the Deputy Administrator for Communications, Technology, and Distance Education, serves as the Senior IRM Official. Seventeen people on the CSREES staff, plus six contract employees, are involved full-time in IRM activities. Thirteen of these individuals work full-time on the CRIS program at Beltsville, Maryland. The Team Leader for Information Technology, three IRM staff persons, plus six contractors devote full-time to CSREES automation support at the Washington offices. The Team Leader for Information Technology reports to the Deputy Administrator for Communications, Technology, and Distance Education.

2. IRM Planning Process

The IRM functions of CSREES are in the Communications, Technology and Distance Education unit and the Science and Education Resources Development unit of the agency. As part of the merger of the Cooperative State Research Service and the Extension Service, the IRM staff was realigned and restructured to meet the needs of the new agency. The IRM planning process in the agency has been unaffected by the consolidation. Coordination with program units continues to be at the core of the IRM planning process.

Annually, each program unit in CSREES is required to prepare an operating budget for the coming fiscal year. The effort also asks each unit to relate its local IRM plan for the upcoming fiscal year directly to the operating budget. These documents enable both the Budget Officer and the Senior IRM Official to be fully aware of each program unit's short- and long-term IRM planning.

As major IRM proposals arise, CSREES appoints functional task groups to focus on the advantages and disadvantages of the new process or technology. The task groups are comprised of both program and technical representatives. In CSREES, a major IRM proposal is defined as any activity that affects more than one unit or exceeds $50,000 in cost. Generally, all major IRM proposals originate with the Senior IRM Official. The agency Budget Officer, and the Senior IRM Official have a direct involvement in planning for all aspects of agency IRM activities. All IRM related procurement exceeding $100 must be reviewed and approved by both the Team Leader for Information Technology and the Deputy Administrator for Communications, Technology, and Distance Education.

3. Current IRM Environment

The CSREES Administrator's Office and all but one program unit are located in four buildings in downtown Washington, DC. The CRIS office is located in the National Agricultural Library (NAL) in Beltsville, Maryland. Data communications between the offices have been improving as technologies and budgets allow. The current agency backbone is an Ethernet LAN used with a combination of Novell and UNIX file servers and is directly connected to the Internet. The CRIS office has a PC-LAN running Novell network software and is connected to a Internet node at the NAL building. Each of the five locations can communicate via electronic mail and have file transfer capabilities. The offices have a mix of personal computers running Windows software, with all systems at the 486 level of capacity or above.

CSREES employs a wide range of automation techniques and equipment to promote and manage agricultural research. This requires extensive communications with the non-Federal sector, as well as other Federal agencies. In order for the agency to maintain its communication with the public, land-grant universities, and campus networks, the use of the Internet system is necessary. Access to the FTS2000 system provides for electronic contact with persons within the Department and other

Government offices. CSREES is currently making databases and files available to the public through conventional telecommunication methods and continues to be on the leading edge of internet-based technologies for methods of program delivery. The staff of CSREES is also able to take advantage of the vast amount of scientific resources on the Internet and the opportunities for collaboration on projects through the Internet.

CRIS is the major single IRM application in the Agency. CRIS serves as the USDA research project system and receives standardized input from the Agricultural Cooperative Service (ACS), Agricultural Research Service (ARS), Economic Research Service (ERS), and Forest Service (FS), in addition to CSREES and over 100 participating State research institutions. The CRIS database is maintained on the IBM mainframe at the National Computer Center - Kansas City (NCC-KCC). The CRIS PC-LAN (Novell NetWare) provides access to NCC-KCC and the INTERNET as well as other outside networks. State participants prepare input to CRIS using specially designed PC-based programs. Data is submitted on diskette or electronically transmitted via the INTERNET. ARS provides data via magnetic tape and disk. FS is nearing completion of a system to provide CRIS data on tape as well. Data for the Human Nutrition Research Information Management System (HNRIMS) is received from the National Institutes of Health (NIH) via computer tape. Data from the Inventory of Canadian Agri-Food Research (ICAR) subfile and data from the Czech Agricultural Research Information System (CZARIS) subfile is also received via magnetic tape. The complete CRIS Technical database is made available in an online mode, worldwide, to the private and public sector through DIALOG Information Services, Inc.; the National Technical Information System (NTIS) database Federal Research in Progress (FEDRIP); and through the COS (Community of Science) World Wide Web system. The technical database is also available on CD-ROM through SilverPlatter, Inc..

The Food and Agricultural Education Information System (FAEIS) is administered by CSREES/SERD-Higher Education Programs (HEP) unit, and is managed by faculty and staff at Texas A&M University. FAEIS offers information on a broad range of higher education statistics related to the food and agricultural sciences. FAEIS presents national data from professional associations, a number of government agencies (e.g. U.S. Department of Education, National Science Foundation, Department of Labor, other Federal agencies), and other national databases. FAEIS offers an accessible resource of empirical information for use in planning and coordinating efforts directed towards supporting higher education in the food, agricultural and natural resource sciences. FAEIS data are used by the academic community (university and experiment station administrators and personnel), the USDA, congressional staff, media, libraries and industry. These data and other information related to agriculture, natural resources, forestry, family and consumer sciences, and veterinary medicine can be obtained through three methods: (1) Annual Reports provide summary information, (2) Specialized Information Requests provide more detailed information requiring additional analysis, (3) FAEIS ON-LINE, the electronic delivery component of FAEIS is designed to disseminate summary information representing the full spectrum of the FAEIS database. FAEIS ON-LINE contains over 400 summary data tables available on agriculture, natural resources, forestry, family and consumer sciences, and veterinary medicine, available through the World Wide Web (WWW) at home page location http://agrinet.tamu.edu/faeis.

Communications, Technology and Distance Education Unit

Communications, Technology, and Distance Education (CTDE) is a recognized leader in helping the nation build the National Information Infrastructure (NII) for agriculture. CTDE utilizes cutting edge communication technologies to provide the critical community access to quality of life research, education, and extension knowledge that empowers citizens to be active participants in reshaping society and solving complex problems at the local level.

Mission

The CTDE mission is to provide key community access to research and education through leadership to the Cooperative State Research, Education, and Extension Service (CSREES) and its partners in the design, organization, and application of communication principles, information technologies, and distance education capabilities.

CTDE is committed to providing equal access to U.S. Department of Agriculture (USDA) and CSREES programs and facilities in all areas, including capital/workplace enhancement, community access and outreach, and educational technology consultation.

Focus

With an innovative integration of communication, access, technology and distance education, CTDE strengthens the public's ability to develop the research-based educational skills and knowledge essential to help individuals, families and communities help themselves. Regardless of where people are located, this crucial connectivity makes available a broader spectrum of global resources and enables more effective learning opportunities.

Communication

Communication is central to every facet of CSREES and the success of its mission. CTDE is often the first introduction many people and organizations have to CSREES. From the latest research initiatives to hot topic issues to fundamental mission-based national programs, CTDE articulates the agency's goals, impacts, and accomplishments across all program areas, presenting the total agency contribution and enhancing its outreach capability.

CTDE is a model of how customer-driven government should communicate and meet its citizens' needs. Its networked-based research and education decision support system positions CTDE to respond quickly and with credibility to emerging issues and public priorities.

Advanced Technology

As one of the earliest Internet leaders, CTDE designed and implemented an electronically-connected partnership linking the federal government, the State Agricultural Experiment Station System, Higher Education, the Cooperative Extension System with over 3,000 local offices nationwide, and other CSREES partners in the land-grant community.

CTDE pioneers new communication technology applications that achieve greater program effectiveness and more efficient use of resources. Examples include the network within a network

concept of CYFERNet, an information infrastructure on children, youth and family issues, and Partners Against Violence (PAVNET). PAVNET is an online search and retrieval system providing access to information on programs to combat violence developed in partnership with the Departments of Education, Health and Human Services, Justice and Labor.

Distance Education

CTDE takes education across time and location to the community with distance education programs that are interactive, strongly learner-centered, and built upon a foundation of sound, research-based principles that truly sustains a lifetime of learning.

Combining technology with educational research, CTDE distance education programs are relevant to the variety of ways people learn. The learner is free from the constraints of time, space, format and content. Quality programs are available when, how, and where the learner wants to access them, enabling better understanding and better use of the knowledge gained. CTDE connects people to people and to global sources for teaching and learning that give both teacher and student the opportunity to maximize their potential.

Bridging The Information Age

Growing from the "library of Rural America" with its vast collection of print publications, today CTDE uses high performance computing and communications technologies to make current research-based knowledge easily accessible to the public. Whether it is global satellite broadcasting, World Wide Web, public access networks, compressed video, electronic meetings, or networked information discovery and retrieval systems, CTDE proactively develops and implements programs that promote equity of access and strengthen community support systems. Providing the bridge into the Age of Information is as important to rural America as the first farm-to-market roads were in the last century.

Leadership

CTDE cooperation and collaboration bring technology and people together in an information and educational network that makes programs and resources available locally and globally.

Through visionary thinking and strategic planning, CTDE is instrumental in guiding agency, mission area and USDA decisions about resource investment, networking, and information and education access at the local, state, and national level.

CTDE continues to model and demonstrate process and programs that reach across the federal government to help build a National Information Infrastructure that links local communities to USDA and other federal departments and empowers citizens to make their government better.

CTDE is

* The Agricultural Telecommunications Program authorized by the 1990 Farm Bill to encourage development and use of an agricultural communications network to strengthen agricultural extension, improve U.S. agricultural competitiveness, train students for careers in agricultural and food industries, facilitate interaction among leading agricultural scientists, and enhance the ability of agriculture to respond to environmental and food safety concerns;

* Immediate electronic access to vital safety and recovery information in response to such time critical disasters as hurricanes, wildfires, and nationwide floods;

* High profile USDA communications activities, such as the first National Rural Conference, including the establishment of a Rural Conference home page on the World Wide Web, coordination of efforts for the four Research, Education, and Economics agencies and advance work on the preceding regional townhall meetings;

* Interactive educational applications of the World Wide Web which go beyond an information access point (http://www.reeusda.gov);

* an Internet-based Rapid Response Network with research, education and extension specialists in such major news-breaking areas as food safety, pesticides, water quality, Africanized honeybee and communications;

* Design, coordination, and production of the Environmental Protection Agency and Cooperative Extension System Migrant Worker Pesticide Protection satellite training program;

* HortBase, a collaborative pilot project of CTDE, CSREES, the University of Oregon, the American Society for Horticultural Sciences, and the Agricultural Communicators in Education, to deliver peer-reviewed research information in an educational format designed for electronic access by Cooperative Extension System customers. Communicators and scientists teamed together to design format and content for ease of search and retrieval;

* Proactive representation for cross agency and intergovernmental activities, such as the National Information Infrastructure, the National Performance Review, Global Information Infrastructure, Government Performance Review Act implementation, and Department of Education Institute on Post-Secondary Education and Lifelong Learning (NIPELL);

* Partnership Networking Initiatives, such as Agriculture Network Information Center, the Harvest Information Discovery and Access System, Integrated Pest Management

System Network Information Center, Food Safety Database, Dairy (Bovine, Ovine, Swine) Databases and Network Information Center, and the Rural Economic and Social Development Network Information Center;

* Expertise on review panels for National Telecommunications and Information/ Infrastructure Administration, Telecommunications Information/Infrastructure Applications Program, Office of Rural Health Policy, Networked Infrastructure for Education and the National Science Foundation;

* Pilot projects like "Ask an Expert," designed to put research and extension expertise of land-grant universities at the fingertips of consumers and producers by creating a "virtual extension office" with capacity to respond to electronic questions within 24 hours;

* International application of a model communications program on issues management and facilitation of problem-solving;

4. Accomplishments

World Wide Web Leadership: USDA Statistics can now be accessed through the World Wide Web thanks to CSREES funding and expertise provided to the Cornell University Mann Library. CSREES is continuing to work with the Mann Library to facilitate expansion of users served with a special focus on providing access to other USDA agencies. CSREES recently demonstrated its World Wide Web Home Page to other USDA agencies interested in Web developmental concepts and established an electronic discussion group for consultation activities with other USDA agencies.

CSREES is making available, electronically, notices of research grants, cooperative agreements, and contracts being solicited by USDA and other Federal agencies. The notices cover solicitations that are likely to be of interest to researchers of Colleges of Agriculture, Life Sciences, SAES, and other similar institutions. Initially, the solicitations will be taken from the Federal Register. The purpose is to provide researchers, research administrators, and contracts and grants officers with faster access to Federal solicitation notices. The Federal Register is the only notification source of many research solicitations. Many researchers and department and grants administrators do not have ready access to the Federal Register, and therefore do not have sufficient time to prepare and submit proposals before the solicitation due dates. Making notices available electronically from CSREES should alleviate this problem.

CSREES staff have undergone training to strengthen their electronic mail and inter-networking knowledge. The agency had developed a new Email Manual specifically for CSREES staff and the Internet. Coupled with this manual are formal training classes geared towards CSREES staff and their work. New employees are given an electronic mail manual and a video to help them become oriented in using electronic mail to accomplish their duties.

During the past year, CSREES has upgraded older equipment to increase productivity, enhance innovation and technology among users, and reduce the costs associated with maintaining obsolete equipment. The agency has upgraded all desktop computer equipment to at least the level of 486 processor power. The returns on the agency's commitment to educational and modern technology are producing measurable results.

The CRIS technical database was recently made accessible via the World Wide Web by CSREES/SERD personnel. New hardware and software were purchased which allowed the CRIS staff to make the technical database available to the public through the INTERNET (via NETSCAPE or MOSIAC). This site provides access to all data in CRIS records. Both full text and field searching, including use of Boolean operators, affords maximum retrieval capability for users. Easier and more widespread accessibility of current research information helps to improve research planning, avoid costly duplication and establish valuable personal contacts.

The Food and Agricultural Education Information System (FAEIS) is administered by CSREES/SERD-Higher Education Programs (HEP) unit, and is managed by faculty and staff at Texas A&M University. FAEIS responded to numerous inquiries about higher education trends in the food and agricultural sciences, by providing access to current and historical data. FAEIS data have resulted in positive public exposure for the food and agricultural sciences via media exposure, and substantial and complementary citations by two national studies: Employment Opportunities for College Graduates in the Food and Agricultural Sciences, 1995-2000, and Colleges of Agriculture at the Land-Grant Universities: A Profile.

Initial procedures were identified on the requirements necessary to move FAEIS ON-LINE from the GOPHER system to HTML language to facilitate access through WWW interfaces. A WWW-compatible front end to the existing GOPHER system was developed and implemented successfully.

FAEIS ON-LINE was updated with timely HEP Grants Information, thus providing a ready source of important, easy-to-access information about HEP competitive grant announcements, applications, and awards.

CSREES-OBJ1 "Agency-Wide Automation" has accomplished virtually all of the goals initially proposed. Connectivity among and between the multi-vendor PCs and file servers now exist and the scientific and support staff has been trained to make good utilization of the office automation hardware and software. Staff communication, both internal and external, has become more effective and productivity has improved as a result.

CSREES-OBJ2 "Enhancing CRIS Operating Technology" has been revised to take advantage of new technologies that have recently been developed. The new approach is described in the new objective "Current Research Information System Enhancement Plan."

5. Future Direction

Communications, educational and information systems will be augmented or developed for use by the Mission Area and its partners. The goal is to create and expand systems based on audience needs. These systems will: encourage development of collaborative work environments; interactive educational opportunities; and enable staff to update and access rapidly changing information. Access to these systems will be tied to the capacity of the audience/learner and will reflect quality and accuracy; and ensure privacy.

In the 1990's and beyond, one of the greatest challenges to the food and agricultural system will be to understand society's concerns regarding technological innovation and its impact on the environment and human health. The system must provide complete and balanced information about the opportunities and risks associated with the uses of biotechnology, genetic engineering, and other scientific advancements. Solutions to some of the Nation's most pressing problems are inexorably tied to basic research that enables science and education to address issues as they arise. Developing environmentally compatible agricultural production practices, increasing the global competitiveness of U.S. food and agricultural products, improving the safety and nutritional quality of the Nation's food supply, and attaining food production levels that match rapid growth in the world's population are just a few areas where progress in achieving successful solutions requires the discovery and application of new knowledge and technology.

The CSREES National Research Initiative Competitive Grants Program (NRI) was initiated in FY1991 with an appropriation of $73 million and authorization for funding at $500 million. The NRI currently funds predominantly basic research, with a minimum of 30 percent mission-oriented funding, in selected high-priority areas including: Natural Resources and the Environment; Nutrition, Food Quality and Health; Animal Systems; Plant Systems; Markets, Trade and Policy; and Processing for Adding Value or Developing New Products. FY 1996 funding is $96.7 million with the President's Budget Proposal requesting $130 million for FY 1997. The NRI currently relies heavily on IRM technology both in proposal management and distribution of information to customers. A significant increase in funding will increase information distribution needs and require additional scientific and support staff along with personal computers and network training to make most effective use of their abilities.

A strategic IRM plan must be developed as soon as possible to cope with increasingly important and diverse IRM needs. Data management, data sharing and inter-operability will be emphasized as existing systems are enhanced and new systems are developed. The integration of data needs of the grants programs, the formula funded programs and the CRIS program will be addressed. Ways to accommodate public access to research data for accountability and general information will be considered. A National Agricultural Research Accomplishments Database will be developed jointly with a Land-Grant University through a cooperative agreement.

At present, the Internet provides linkage to virtually all the SAES, Forestry Schools, Veterinary Colleges, Tuskegee University and the Land-Grant Schools of 1890, as well as other public and

private institutions. CSREES will concentrate on improving the ease and speed of communications with State institutions and will make a number of in-house databases and directories directly accessible.

The CRIS system will take a multi-faceted approach to enhancement by (1) concentrating on PC-based systems for our State/Federal partners for data preparation and data input, and by (2) providing direct access for CRIS users to extract and manipulate data with our assistance from the CRIS staff. Currently, a cooperative agreement with the University of Arizona has been established to assist in the enhancement of the CRIS to meet current needs of USDA and the cooperators. CRIS is constrained today by outdated technologies, a taxonomy that does not include recently emerging areas of science, and an inability to provide program data, in addition to project data, in a manner easily understood by the user base. Also the system cannot adequately identify current and emerging national issues.

The FAEIS system will continue to maintain high standards for data quality, customer service and information access. FAEIS plans to enhance FAEIS ON-LINE by making all on-line files accessible to the WWW. FAEIS also plans to upgrade databases with modern, advanced software.

The agency looks forward to the success of the "Modernization of Administrative Process" (MAP) program. There has been a longstanding need in USDA to eliminate unnecessary administrative procedures and paperwork and coordinate and consolidate the various automated systems. MAP has to be a USDA wide effort due to the scope of the problem. However, for specific needs in the administrative area, CSREES plans to evaluate imaging systems and the like as a way to replace the inefficient, large volume hard copy files with a modern electronic filing system. This will provide easier and more wide-spread access to project records.

B. Agency IRM Objectives

1. Objective Title: OBJ1 - Agency-Wide Automation

2. Status: Revised

3. Objective Statement: Develop an office environment where up-to-date user friendly IRM technology is available for all scientific and support staff to use. Improve individual and overall productivity through a combination of office automation and telecommunications. Increase staff usage of the Internet system to provide improved services to and communications with State partner research institutions. Emphasize automation of client driven programs. This objective has no hard ending dates and is continuously evaluated and updated.

4. Strategy:

   a) Develop and implement a strategic plan.

   b) Develop connectivity between multi-vendor PCs and host computer systems.

   c) Acquire appropriate software to support office automaton.

   d) Train scientific and support staff to make efficient use of hardware and software.

   e) Emphasize the use of telecommunications in the accomplishment of duties.

   f) Automate some universal staff functions such as project review and electronic filing systems.

5. Program Supported:

   This objective contributes to the following agency mission-oriented objective: 1) to develop, analyze and present information on the needs and accomplishments of agricultural research, education, and extension: 2) to improve the effectiveness of existing and new processes established for the delivery and accountability of Federal resources; and 3) to improve cooperation with other State, Federal, and private participants.

6. Cross-Cutting Programs Supported:

   Support of all USDA Cross-Cutting Programs is improved through improved automation and communication among Federal and State scientists.

7. Background:
Information technology was integrated into the business of the predecessor agencies of CSREES and has been enhanced since the reorganization. A major workplace enhancement effort was initiated in FY 1995 and will be completed in FY 1996. The workplace enhancement effort consolidated all agency computer workstation procurement initiatives within the CTDE unit. Additionally, training on the use of computers and applications throughout the agency has been coordinated by the CTDE unit.

CSREES has pioneered the implementation of networked information discovery and retrieval throughout the Department. The agency has developed resources that leverage the power of the Internet to provide improved customer access to its' programs and information.

8. Contact Name: Jerome J. McNamara
Organization: Cooperative State Research, Education, and Extension Service
Phone Number: 202-720-8188

9. Major Milestones

	Planned		Actual
	Start Date	End Date	End Date
a. Develop a strategic planning document for CSREES.	Dec. 1994	Ongoing	
b. Develop a strategic plan for Implementation of Technology within CSREES.	Jan. 1995	Ongoing	
c. Analyze hardware and software infrastructure.	Jan. 1995	Ongoing	
d. Acquire needed infrastructure upgrades.	Aug. 1995	Ongoing	
e. Analyze user desktop needs.	Jan. 1995	Ongoing	
f. Acquire and install equipment.	Aug. 1995	Ongoing	
g. Implement New Software and train staff.	Sept. 1995	Ongoing	

10. Resources	Thru FY95	FY96	FY97	FY98	FY99+	TOTAL
Total Costs ($000)	192	360	200	200	300	1,252
Staff Years	2.0	2.0	2.0	2.0	2.0	2.0

11. Acquisition Description

FY 1995 - Acquisitions to begin the replacement of old equipment ($192.000).

FY 1996 - Routine acquisitions to replace obsolete equipment ($360,000). Acquisitions brought operational infrastructure and desktop resources in line with current needs. Future acquisitions will follow a schedule and should not need the expenditures to be as severe as in this FY.

12. Department IRM Implementation Framework Supported

* Business and Customer Support
* Information and Data Management
* Delivery Systems.

B. Agency IRM Objectives

1. Objective Title: OBJ2 - Current Research Information System (CRIS) Enhancement Plan

2. Status: New

3. Objective Statement: Make the CRIS more effective and efficient in its computer operations and more user-friendly and useful to State and Federal users.

4. Strategy: (1) Develop and implement strategies and mechanisms for improving CRIS in order to meet the needs of its clientele. (2) Develop a means for CRIS to evolve in order to reflect new and emerging areas of agricultural research. (3) Improve the systems responsiveness and accessibility to research managers, research participants, and clientele. (4) Develop an accountability and accomplishments reporting process to comply with the new GPRA. (5) Develop a bridging concept that will enhance CRIS's ability to become an integral component of the future, more comprehensive REE Information System.

5. Programs Supported: This objective contributes to the following agency mission-oriented objectives: 1) to develop, analyze, and present information on the needs and accomplishments of agricultural research and higher education; 2) to effectively manage agricultural research and higher education projects, structures, and institutions.

   CRIS addresses research information needs by providing a database of all research sponsored or conducted by the USDA as well as over 100 cooperative State research institutions. The technical information in the CRIS database is made available to USDA and state scientists and other public or private individuals and institutions both online and on CD-ROM by commercial and Government organizations. It is also available via INTERNET. The fiscal data in the database is used by research managers to help them manage their programs more effectively.

6. Cross-Cutting Programs Supported: CRIS is an interagency program which is funded by and supports the research programs of ACS, ARS, CSREES, ERS and FS. In addition, HNIS and OICD contribute data to CRIS.

7. Background: The CRIS was established in the late 1960s as a database on agricultural research conducted by or through USDA agencies and their cooperators. CRIS presently contains data on over 35,000 current or recently completed projects. Coverage includes projects conducted by USDA's research agencies, 58 State Agricultural Experiment Stations, 14 Forestry Schools, 28 Schools of Veterinary Medicine and 16 1890 Colleges plus Tuskegee University. Research funded under the USDA National Research Initiative Competitive Grants Program and CSREES's Special Grant and Cooperative Agreement Programs are also included in CRIS. Despite this broad coverage of research, CRIS is constrained today by outdated technologies, a taxonomy that does not include recently emerging areas of science, and an inability to easily provide program data.

Also, the system cannot adequately identify current and emerging national issues.

This initiative is being conducted via a Cooperative Agreement with the University of Arizona (Drs Colin Kaltenback and Kurt Feltner) and will use a committee approach to establish and guide the overall approach to design, develop, test and implement proposed enhancements to CRIS. This group will include both users and producers of agricultural research data. The advisory committee will help guide a smaller working group that will create specific assignments and timetables for a number of technical experts needed to develop and implement the planned enhancements to CRIS, assist in engaging them and monitor, guide and coordinate their efforts.

8. Contact Name: Theodore K Bauer
   Organization: CSREES/SERD/CRIS
   Phone Number: 301-504-5847

9. Major Milestones:

	Planned		Actual
	Start Date	End Date	End Date
a) Ariz meet with key individuals to confirm specific goals	02/96	02/96	02/96
b) Identify and recruit for small working groups and larger Advisory Committee	03/96	03/96	03/96
c) Working Group outline plan of work and specific approaches	05/96	05/96	05/96
d) Meet with Advisory Group to review product of Work Group	06/96	06/96	
e) Revise Work Group Plan of Work as needed	07/96	07/96	
f) Recruit Technical Experts	08/96	08/96	
g) Monitor, coordinate and guide technical experts	09/96	12/96	

h) Combined meeting of Work Group, Advisory committee and Technical Experts to review and evaluate	01/97	01/97
i) Guide and coordinate activities of Technical Experts	02/97	03/97
j) Publish and report recommendations	04/97	05/97

10. Resources:

	FY 96	FY 97
Total Costs ($000)	$43.4	$56.6
Staff Years	2.0	2.0

11. Acquisition Description: At this point, no acquisitions are planned.

12. Departmental IRM Implementation Framework area supported:

*Information and data management
*Application information systems

CHAPTER IV

Economic Research Service (ERS)

INFORMATION RESOURCES MANAGEMENT PLAN, 1997–2001

1. Introduction

a. Agency.

ERS was reorganized on October 1, 1994, as a result of a new ERS strategic plan and consistent with the USDA reorganization mandated by the USDA Reorganization Act of 1994 (see attached organizational chart). This IRM plan addresses the IRM implications of the programs, organizational structure, and resource levels envisioned in the ERS strategic plan.

b. Agency IRM Program.

ERS' IRM program is shaped by the Information Services Coordinating Committee (ISCC), the Board of Directors for ERS' Information Services Division (ISD). The ISCC is chaired by the ERS Associate Administrator and has representation from all ERS program areas. The ISCC reviews all ISD activities; develops, via subcommittees, policies for the standardization of software and hardware; and recommends initiatives for approval by agency management. The key customers of the IRM program are the ERS program divisions.

2. IRM Planning Process.

The agency IRM planning is guided by the ISCC. Major initiatives are presented to the ISCC for appropriate review and action. Particular items are assigned to subcommittees for investigation and development of options and recommendations for action. Items approved by the ISCC are then reviewed by the Senior IRM Committee composed of the Administrator, Associate Administrator, and Division Directors.

The Agency participates with the other agencies reporting to the Under Secretary for Research, Education and Economics in the REE Communications and Technology Coordinating Council. The Council addresses issues of mutual concern and is to coordinate resources, projects, and communications between and among the four agencies supporting the REE mission area.

3. Current IRM Environment.

Many system architectures can realize the computing environment needed to accomplish ERS' mission. The architecture below is based on further development of the existing ERS architecture, but with the view that technological evolution, especially in communications and operating systems, will soon result in an effective merger of this architecture with emerging government standards.

Hardware. The long-term configuration of ERS' Local Area Network (LAN) is based on integration of multiple computing platforms available to ERS staff. These platforms are in four general categories: mainframes, mid-range ERS systems, workgroup systems, and desktop computers.

Mainframe computing available to users will include the very large computer systems available through the Departmental Computer Centers (Kansas City and New Orleans), private service providers such as Martin Marietta, and other sources of information and data needed by ERS users. The primary function of these centers will be to provide access to databases and other information resources shared across the department. Over time, access to many sites will become available through ERS' LAN.

The mid-range ERS system will support the internal integration of work group servers, desktop computers, and external resources. Its primary functions will be the operation and control of ERS' LAN and its interconnections with external systems. Additional resources will be available for temporary staging of data and the execution of functions not available on the workgroup systems.

A workgroup system, with its associated servers and communications, is a logical association of the local computing power of the workgroup. That is, it is a physical segment of ERS' LAN but provides primary support to the workgroup. Workgroups use network servers to share resources among the desktop systems of the workgroup. The servers also provide storage and access for data resources "owned" by the workgroup. The shared resources, in addition to databases, include printers, modems, faxes, backup devices, and software.

Desktop computers provide each ERS staff member with the computing power needed to perform assigned tasks. A desktop system configured as a standard workstation will include hardware, software, and communications components needed to access and use ERS' LAN and the resources available through it, including information, data, and software. The standard workstation will evolve as necessary to keep pace with technological changes. Each employee will have access to the software that is needed to perform assigned tasks. This will be located on any of the platforms and will range from word processing and spreadsheets to database and analytical packages.

Communications. The standard network topology is the token ring. ERS' LAN is composed of five rings connected by bridges. Each ERS division is attached to a physical ring and defined as a domain on that ring. Each ring has access to the other rings through a bridge. The domain defines the resources available to the division. A gateway for each ring will provide access to ERS's central computing services. Desktop workstations will then have access to services throughout ERS' LAN, to all of its centralized services, and to external computing facilities.

Software. The individual employee's workstation provides the entry point to all of the services on ERS' LAN. As such, it is the dominant element of the system. All software that is developed or procured for the system will incorporate the same look and feel. All workstation software and interfaces to other platforms will be based on a graphical user interface (GUI) standard, which defines how the user interface looks and works across platforms. Using this standard, all software will use the same features (action bars, pull-downs, icons) and will follow the same object

representations. The intent is to develop user-friendly front-ends to services that are similar across all applications.

ERS' LAN uses client-server technology. Under this concept, processing is distributed throughout a network of intelligent devices. Processing can be accomplished at the workstation or at the server. The server can be any of the platforms in the system depending on the processing power needed. The intention is to provide access to information from one or more locations that can be brought back to the workstation for manipulation. This contrasts with the centralized storage of information in an ERS-wide database.

The client-server implementation relies on the use of a relational database management system (RDBMS) and structured query language (SQL). The RDBMS stores information as tables of rows and columns and includes tools to access data in one or more related tables based on user-supplied criteria. An RDBMS, wherever it is physically stored, is the logical server in the client-server architecture. Client applications on desktop workstations communicate with the RDBMS through SQL, a data manipulation language. SQL is a standard that is incorporated in many software packages including spreadsheets and word processors, as well as the RDBMS. Under the RDBMS and SQL implementation concept, a data query from a single client can be distributed to the various servers storing the requested data and the resulting information will be returned to the client application.

4. **Accomplishments.**

ISD serves primarily as a facilitator and enabler to the agency staff. The division has completed the networking of the agency, establishment of standards in the software and hardware arena, developed electronic methods to produce publications, introduced electronic forms of output distribution, and developed databases and analytical routines for program division staff to complete their tasks.

The agency develops improvements in an evolutionary manner. Each step is designed to improve access to data; improve internal and external communications through electronic media; provide a high level of confidence in the analytical tools available for staff use and therefore in the final output; improve outreach to customers through enhanced physical and electronic products; and to improve integration of special program needs in the design of the overall IRM architecture.

Accomplishments over the past year include:

Implementation of a comprehensive agency information technology training program.
Opened the ERS Information Center, which provides ERS customers information inquiry and referral services by phone, e-mail, and in person.
Implemented a program to distribute ERS situation and outlook reports, all NASS reports, and the WAOB WASDE report on the Internet through Cornell University.
Installed a new AutoFAX system for improved information dissemination of ERS products.
Developed the ERS presence on the World Wide Web through the ERS home page.

Participated in the creation of the first REE strategic plan and coordination of REE-wide activities.
Restructured the ERS LAN to reflect the agency's reorganization and provided connectivity to each employee's workstation.
Created a Help Desk to provide day-to-day support of workstations used by agency staff.
Conducted a complete review of all applications supported by ISD and met with program divisions to discuss resource commitments and scheduling.
Identified WordPerfect 6.1 for windows as the agency standard for word processing and upgraded ERS staff to this level. Also trained all users on new features.
Identified GroupWise as the agency standard for office automation services and upgraded all ERS staff to GroupWise. Provided all staff with needed training.

5. **Future Directions.**

This IRM plan focuses on a vision of what ERS's IRM environment should look like to provide a framework for decision making on actions to achieve that vision, including: hardware, software, and communications procurement; systems and applications development; integration of computing technologies with program functions; and management of computing services and support in ERS.

The vision of the future outlined here is based on a current assessment of user needs and of known and anticipated technological options available to meet those needs over the five-year planning horizon. Frequent assessments are needed to adapt the plan to changing needs and technological developments, add capabilities to the basic framework, and sharpen its focus.

While this IRM plan envisions delivery of information, data, knowledge, and powerful tools to every desktop in ERS, it does not address specific applications. Rather, it assumes that specific application needs will be addressed with systems that extend and complement the basic capabilities available ERS-wide. The plan assumes that all staff members should be able to use every available capability needed to perform their jobs. This means that ERS stands ready to provide the needed capabilities at the users' desktops, including hardware, software, communications, training, and support.

This vision of the ERS electronic workplace assumes that ERS programs will continue to evolve in response to changing customer needs and resource availabilities. It also assumes that program redirection will not change substantially the tasks needed to accomplish program objectives. These tasks include information and data collection and assembly, research and analysis, and development, publication, and dissemination of economic and other social science information. An additional assumption is that all staff will be trained to use new workplace technologies effectively. With these assumptions in mind, one can envision an increasingly technically sophisticated ERS office environment with the features outlined below.

The heart of the electronic workplace is a personal desktop computer. This computer is the personal tool of the staff member at his/her desk, but it is also an integral part of a total computing environment that enables each employee to use advanced technologies for the efficient, effective, and timely delivery of information. Through his/her desktop computer and its connection to ERS' LAN, each staff member has access to and use of the following interrelated components:

- a communications network linking ERS users to each other, other USDA agencies, external providers of information and data, users of ERS's information and data products and services, and colleagues around the Nation and world;

- a series of databases for information, data, and metadata used to support ERS's program functions;

- a suite of state-of-the-art scientific and analytical software for economic and social science computation, research, and analysis;

- an integrated system for the production and dissemination of ERS publications and electronic information and data products and services; and

- office management, personal information, and workgroup productivity tools to help users navigate the electronic workplace and maximize its potential benefits and efficiencies.

Each part of this total environment is described below in terms of both its role in the overall system and the user services delivered with it.

Communications. ERS' communications network serves, first and foremost, to connect all ERS desktop computers to each other and to other ERS computing platforms. On ERS' LAN, staff communicate with each other through electronic mail, transfer data and documents, use groupware (where two or more individuals work simultaneously on the same task), and use automated workflow systems (where documents/files are forwarded automatically to the next person along a chain of those who need to have/use them).

ERS' LAN is also the gateway through which ERS staff gain access to other networks. Imbedded in the LAN is the routing information needed to connect to other USDA networks, the Internet, the public communications network, and to external data sources and users. The technical knowledge required to access these networks is built in so users can make simple menu choices to send a message or a file to a university colleague via the Internet, connect to other USDA agencies, or send a copy of a document to a fax machine at a distant location using a public network.

Databases. ERS has a distributed environment for the organization and management of information and data. Databases, including databases of metadata, tables, text, graphics, images, and documents reside with their logical owners on desktop systems or workgroup servers. Research data are located with users to serve individual needs. Information and data of a permanent nature are stored and managed on database servers for shared access by all users. The ERS data directory facilitates user search and retrieval from all databases and supports development of applications for information and data retrieval, analysis, and reporting.

Users at their desktop computers are linked to the LAN for access to metadata resources, including the Reference Center catalog, CD–ROM literature indexes like Agricola, and the ERS data directory; information resources in the form of electronic reports and journals, bulletins, and administrative announcements: data resources residing on database servers throughout ERS; and models, graphics, knowledge bases, and similar materials. A user can tap the ERS data directory for a reference to an ERS database, for example, and download the needed data to his/her desktop computer if the data listed in the directory are located on a source accessible electronically and are available for general access.

Research and Analysis. ERS staff use a broad array of analytical tools to deliver ERS programs. ERS supports selected software packages to meet generic processing needs such as spreadsheets, database management systems, graphics, statistical processing, and word processing. Interfaces for these packages provide interoperability and consistent operation across the system.

Software changes include:

- Graphical user interface (GUI) technology to provide a consistent and intuitive point-and-click interface on the desktop computer.

- Broad standardization and close integration of software through object linking and dynamic data exchange between packages are routine (e.g., changing the data in a spreadsheet or database automatically updates a table in a report or a related graphic).

- Database access also uses a graphic interface and takes advantage of client-server technology. Complex database functions are performed transparently on a relational database package (the server) through interaction with a familiar front-end package such as Lotus 1-2-3 (the client).

Most software is user friendly, allowing less-advanced users full access to advanced features. Gains in productivity are realized in most areas of work, but especially in data management and analysis.

Expert systems, neural networks, and other knowledge-based software tools enhance the decision making and modeling efforts in ERS. In parallel with these systems, the client-server approach to database implementation permits efficient use of powerful microcomputer database management

systems to organize, sort, and use data. This approach also affords users of small databases access to the power of software formerly reserved for large databases. Also, ERS receives and releases much data on CD–ROM.

ERS analysts routinely switch from one software package to another using multi-tasking technology. Cutting and pasting between programs (mostly among database, spreadsheet, graphics, statistical, and word processing packages) and interprogram file linking (e.g., databases linked to graphics or statistical packages) are routine.

Users of the supported packages have access to databases as noted above and into publication processing software. Users also have access to and support for state-of-the-art modeling and analysis software for research.

Information and Data Products and Services. ERS staff prepare and present briefings, conference papers, and similar materials almost daily. These activities are supported by use of modern multimedia production systems such as color printers, slide-making systems, video tape production and editing systems, and other multimedia systems. Authors, editors, and designers work simultaneously on reports, and these reports are linked into systems for electronic dissemination, including dissemination on CD–ROM. Similarly, integrated systems link database developers to electronic data products, bulletin boards, and other dissemination systems.

An integrated system linking information and data production to information and data dissemination in all its forms is used for effective, efficient, and timely delivery of ERS products and services. A group of authors, reviewers, editors, and designers linked through ERS' LAN is the cornerstone of the ERS publication process. Those involved in the publication process can communicate instantly with each other over the network via a groupware arrangement. This means that everyone involved has immediate and simultaneous access to the draft manuscript to aid planning and tracking. And everyone shares certain common elements:

- Desktop access to, and familiarity with, a standardized publication tool kit. The tool kit contains a variety of software packages from which users can select the most appropriate tool for a specific product or task.

- Knowledge of ERS standards and policies that help determine what gets published and how it gets published. Authors know what content standards must be met to get something published. Everyone is familiar with the well-defined publication series.

- A clear understanding of the ERS audience. Each knows who the audience is and what type of product that audience desires.

Authors compose draft manuscripts directly on their workstations, prepare electronic graphics, and link these directly into their draft manuscripts. All software packages are linked dynamically. This means a change in any facet of the manuscript draft will automatically be made in all the

linked software. For example, a number that is changed in a spreadsheet or database is automatically changed in any related charts and text.

All clearances (branch, division, agency, REE, and Departmental) are done electronically. Several reviewers can electronically review the manuscript simultaneously. They can electronically embed their notes and comments into the draft. The author can view the notes and comments from all reviewers at the same time and respond to each as appropriate.

Authors let editors know when the draft manuscript is ready for review. The editor's work is done entirely on screen. Large computer monitors display several pages side by side. This feature allows editors to view, read, and work on many pages simultaneously. Discussions with authors are in person, by voice notes, or by E-mail through the network. Technology eliminates the need for passing paper back and forth between editor and author. Authors view editorial changes electronically. Acceptance of editorial advice and revision is completed by simple keystrokes.

Camera-copy production is a continuous, cooperative process involving the author and editor. At each stage, as a revision or refinement is accepted electronically, it automatically becomes a part of the final document. Once all the elements of a draft have been reviewed and finalized, actual output takes a variety of formats:

Electronic copy: Published reports are delivered to users via the ERS LAN's link to the Internet. Most periodical subscriptions are delivered this way.

Paper copy. A regular print run produces paper copies for customers who cannot receive their copies electronically. When stock from the regular press run is exhausted, ERS can also print on demand (i.e., produce a paper copy by specific request). The publication demanded is printed in its original colors so that there is virtually no difference in appearance between the single copy and the regular print run.

Archive copies. A report is automatically stored in the publications database for retrieval by ERS researchers from their desktops. It is also stored on optical media, such as CD–ROM, where it is permanently archived and instantly retrievable. Publications CD–ROMs are issued routinely for public use.

Personal and Workgroup Productivity. Electronic calendaring, message routing, document sharing, and other time management services are provided through ERSNET. Every employee has access to standard features and optional personal tools to navigate the electronic office. Electronic mail, fax, and voice mail services are commonplace, including electronic mail to and from research colleagues around the country and the world. Within workgroups, innovative groupware systems support collaborative work on research projects, staff analyses, and situation and outlook activities.

IV. Objectives

1.1. **Objective Title:** Network Computer Systems

1.2. **Status:** Ongoing.

1.3. **Objective Statement:** To provide each employee of ERS with a microcomputer workstation linked to agency wide office systems and data processing resources to aid in data and document sharing and transfer as well as to external networks such as the Internet.

1.4. **Strategy:** Token ring backbone cabling is installed throughout ERS. This provides the ability to attach microcomputers to ERS' LAN. Five workgroup domains are defined on the rings that comprise ERS' LAN. The domains are installed in a serial fashion, and new applications are developed as needed. Resources needed by each domain are identified during the analysis period. Typical configurations require multiple servers, based on large microcomputers, supporting 75-200 workstations. Through the LAN, each workstation also has access to ERS's central processor, external computing resources at NCC–KC, as well as other workstations throughout ERS.

Funding in the past has been limited and has impacted negatively on the completion of extending cables to the workstations. ERS continues to upgrade workstations in a piecemeal fashion, depending on the availability of funding, to provide the capacity needed to run the complex software being developed by the major software vendors.

1.5. **Programs Supported:** Networking supports all program areas. Microcomputers serve as an integral part of the agency information processing system. To maximize efficiency, each workstation must have access to any resource needed. Connectivity to all levels of computing services allows the analyst to use the most efficient and effective methodology available.

1.6. **Cross-Cutting or Interagency Programs Supported:** As an integral part of the agency processing system, networking supports all three cross-cutting initiatives.

1.7. **Background:** Progress on providing connectivity to each workstation in ERS has been moving slowly over the last several years. The main backbone has been installed, and workstations are provided access as resources enable. Generally, connectivity to ERS' LAN is approved after a plan of operation is developed and required resources can be allocated.

1.8. **Contact Name and Phone Number:** A. Michael Ahrens—202–219–0761.

1.9. **Major Milestones:**

	Planned		Actual
	Start Date	End Date	End Date
a. Develop network architecture	1/86	3/87	3/87
b. Test token ring network	1/87	4/88	3/88
c. Install token ring backbone	4/89	2/90	2/90
d. Upgrade microcomputers for network attachment/ performance	1/91	12/96	
e. Install domain microcomputers	2/91	1/95	6/95
f. Gather requirements for external networks	2/91	1/92	6/92
g. Implement access methodologies to selected external network services	2/92	4/92	6/92
h. Gather requirements for interconnection to other USDA agencies	4/93	4/94	3/94

1.10. **Resources:**

				THRU				
	FY96	FY97	FY98	FY99	FY00	FY01	FY02+	Total
Total Cost ($000)	2,500	100	0	0	0	0	0	2,600
Staff-Years	15	1	0	0	0	0	0	16

1.11. **Acquisition Description:** None.

1.12. **Departmental IRM Implementation Framework Area Supported:** This objective is aligned with the Information and Data Management and the Delivery System components of the Departmental IRM Implementation Framework.

2.1. **Objective Title:** Distributed Database Management System

2.2. **Status:** Ongoing.

2.3. **Objective Statement:** To optimize the use of data, it is necessary to accommodate their storage at any of the available computing platforms. The available platforms are the large departmental centers, the agency's central processor, super-microcomputer servers on ERS' LAN, and individual workstations. The goal is to locate data where they can be most efficiently accessed and analyzed.

2.4. **Strategy:** The employee workstation is the key component of the agency's information processing system. The power to complete a task is to be placed where it can most effectively be used. Each of the four computing platforms becomes a target for the storage and processing of data.

The first application of this distributed approach is the ERS-wide directory of information. The directory contains no actual data, but documents data holdings throughout the agency and directs users to the appropriate source. The design places the directory system on a LAN server. The server is available to each workstation on ERS' LAN. The workstation assumes the client role and receives requested documentation from the server. Expectations are that the network can support the traffic and that the server can meet expected processing cycles. Performance will be evaluated and, if problems exist, alternate platforms will be used for future operations.

The performance statistics gathered from the directory project provide needed input into the analysis and design of other database projects. Other pilot databases will be implemented on workstations, workgroup servers, division servers, and possibly an ERS-wide server. Regardless of location, all systems will be based on the client-server methodology and will incorporate a standard graphical user interface and structured query language for access.

2.5. **Programs Supported:** This is an integral part of ERS's IRM design and is supportive of all ERS programs.

2.6. **Cross-Cutting or Interagency Program Supported:** All new applications will be designed following the distributed, client-server strategy. As such, this is supportive of each initiative.

2.7. **Background:** ERS' Information Services Coordinating Committee (ISCC) has designed ERS's information processing system on the networked workstation concept using a distributed client-server technology. This is based on the need to place information and processing power as close to the employee as possible. However, the placement of the server will depend on other variables such as the size of the database, volatility of the data, security issues, and number of users needing access.

2.8. **Contact Name and Phone Number:** A. Michael Ahrens—202–219–0761.

2.9. **Major Milestones:**

		Planned		Actual
		Start Date	End Date	End Date
a.	Install agency wide information directory on ERSNET	2/91	1/92	2/92
b.	Provide automated search feature for directory	1/93	6/93	12/93
c.	Install pilot server-level database on ERSNET	4/91	3/92	3/92
d.	Develop requirements for user interfaces to pilot server databases	2/92	1/93	1/93
e.	Demo user interfaces to server databases	3/92	2/93	4/93
f.	Prepare proposed standards for server-level databases and user interfaces	3/93	8/93	12/93
g.	Formalize standards	4/93	12/93	1/94
h.	Develop active directory capability to navigate distributed databases	3/93	12/96	
I.	Develop GUI-based applications to relational tables pilot with Specialty Agriculture Branch information on vegetables	12/93	9/93	10/94
j.	Review farm income programs to replace central database with distributed tables	6/93	5/96	

2.10. **Resources:**

				THRU			
	FY96	FY97	FY98	FY99	FY00	FY01	FY02+	Total
Total Cost ($000)	1,675	300	300	300	0	0	0	2,575
Staff-Years	21	5	5	5	0	0	0	36

2.11. **Acquisition Description:** None.

2.12. **Departmental IRM Implementation Framework Area Supported:** This objective is aligned with the service to management aspect of the Business/Customer Support component as well as the Delivery System component of the Departmental IRM Implementation Framework.

3.1. **Objective Title:** Management/Operations of ERS Computer Room, LAN Administration, and Microcomputer Hardware and Software Support.

3.2. **Status:** Ongoing.

3.3. **Objective Statement:** To optimize performance of ERS equipment utilization by minimizing downtime and centralize support of standard sets of software.

3.4. **Strategy:** Monitor usage and performance of agency-level systems and make board level repairs to microcomputers to keep equipment available to users. Develop standards for supported software products to minimize training and support costs and to improve software interactions.

3.5. **Programs Supported:** This is a core resource of the agency and is vital to achieving all program objectives.

3.6. **Cross-Cutting or Interagency Programs Supported:** Not applicable.

3.7. **Background:** ERS' Information Technology Services Branch provides support of in-house standard ADP equipment and software. With increased use of microcomputers and networked devices, this remains a critical support area.

3.8. **Contact Name and Phone Number:** A. Michael Ahrens—202–219–0761.

3.9. **Major Milestones:** No major new objectives. Maintain availability to users.

3.10. **Resources:**

	THRU FY96	FY97	FY98	FY99	FY00	FY01	FY02+	Total
Total Cost ($000)	*	832	848	865	883	0	0	*
Staff-Years	*	15	15	15	15	0	0	*

*Ongoing Support—not related to a specific initiative.

3.11. **Acquisition Description:** None.

3.12. **Departmental IRM Implementation Framework Area Supported:** This objective falls under the Delivery System of the Departmental IRM Implementation Framework.

4.1. **Objective Title:** Ongoing Support of ERS Staff.

4.2. **Status:** Ongoing.

4.3. **Objective Statement:** To optimize the utilization of microcomputer systems in the process of creating ERS products.

4.4. **Strategy:** The majority of the analytical processes at ERS involve the use of off-the-shelf software packages to manipulate data received from external sources. A major charter for ISD is to provide the special assistance staff members may require in meeting their objectives. This is provided through many different methods depending on staff needs.

4.5. **Programs Supported:** This is a core resource of the agency and is vital to achieving all program objectives.

4.6. **Cross-Cutting or Interagency Programs Supported:** Not applicable.

4.7. **Background:** The Application Design and Development Team of ERS' Information Technology Services Branch is chartered with providing direct support of program division projects. Each program division has unique needs and uses particular types of software in reaching program objectives. The majority of assistance is for one-time projects that generally require a small amount of time. Only a few require more than one staff-year of effort.

4.8. **Contact Name:** A. Michael Ahrens—202–219–0761.

4.9. **Major Milestones:** No major new objectives. Maintain responsive support to staff.

4.10. **Resources:**

	THRU FY96	FY97	FY98	FY99	FY00	FY01	FY02+	Total
Total Cost ($000)	*	1,173	1,196	1,100	1,000	0	0	*
Staff-Years	*	15	15	13	10	0	0	*

* Ongoing Support—not related to a specific initiative.

4.11. **Acquisition Description:** None.

4.12. **Departmental IRM Implementation Framework Area Supported:** This objective falls under the Application Information Systems of the Departmental IRM Implementation Framework.

5.1. **Objective Title:** Establish ERS WWW and Home Page.

5.2. **Status:** New.

5.3. **Objective Statement:** To use the capabilities of the INTERNET to provide access to agency information to the widest possible audience.

5.4. **Strategy:** A subcommittee of the ISCC develops the home page policy. The home page will be installed on a dedicated WWW server with security provided through a firewall. The system will be based on an INTEL microcomputer server and firewall.

5.5 **Program Supported:** This will become another method of distributing agency information and as such, is supportive of the agency mission.

5.6. **Cross-Cutting or Interagency Programs Supported:** Not applicable.

5.7. **Background:** The agency management has endorsed the use of various distribution channels for agency data and information. The ISCC recommended that ISD develop INTERNET and WWW capability to increase the availability of agency products.

5.8. **Contact Name and Phone Number:** A. Michael Ahrens 202-219-0761.

5.9. **Major Milestones:**

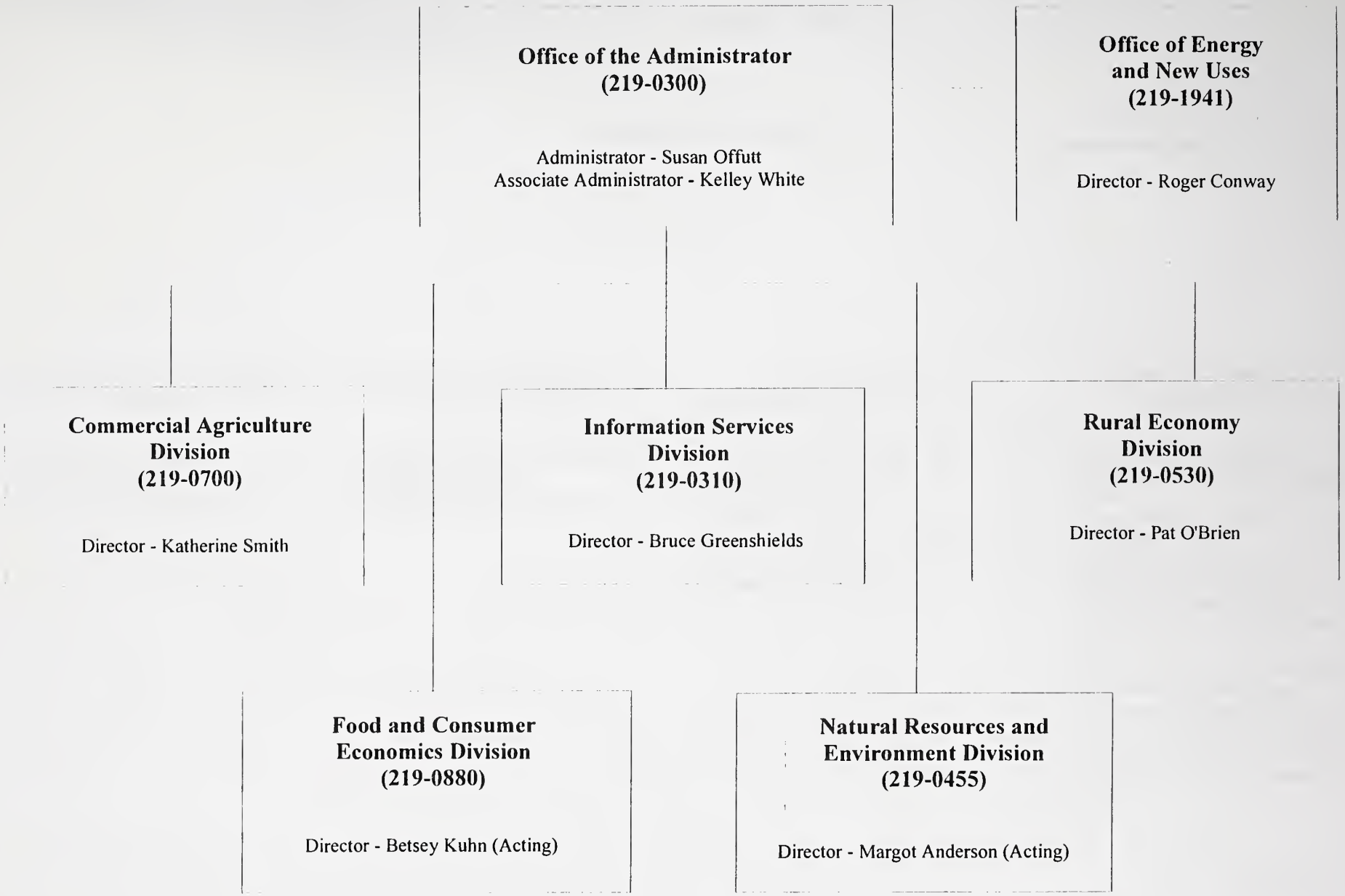
		Planned		Actual
		Start Date	End Date	End Date
a.	Develop prototype	11/95	9/96	
b.	Develop Home Page policy	4/96	9/96	
c.	Identifying initial Firewall product	1/96	9/96	
d.	Set up production WWW server	1/96	9/96	
e.	Create process to monitor content of Home Page	4/96	9/96	
f.	Create production Home Page	1/96	9/96	
g.	Refine Home Page	9/96	12/96	
h.	Review server and additional functions	12/96	1/97	

5.10. **Resources:**

	THRU FY96	FY97	FY98	FY99	FY00	FY01	FY02+	Total
Total Cost ($000)	300	350	0	0	0	0	0	650
Staff-Years	4.5	5	0	0	0	0	0	9.5

5.11. **Acquisition Description:** Purchase of firewall software and INTEL microcomputer for operation.

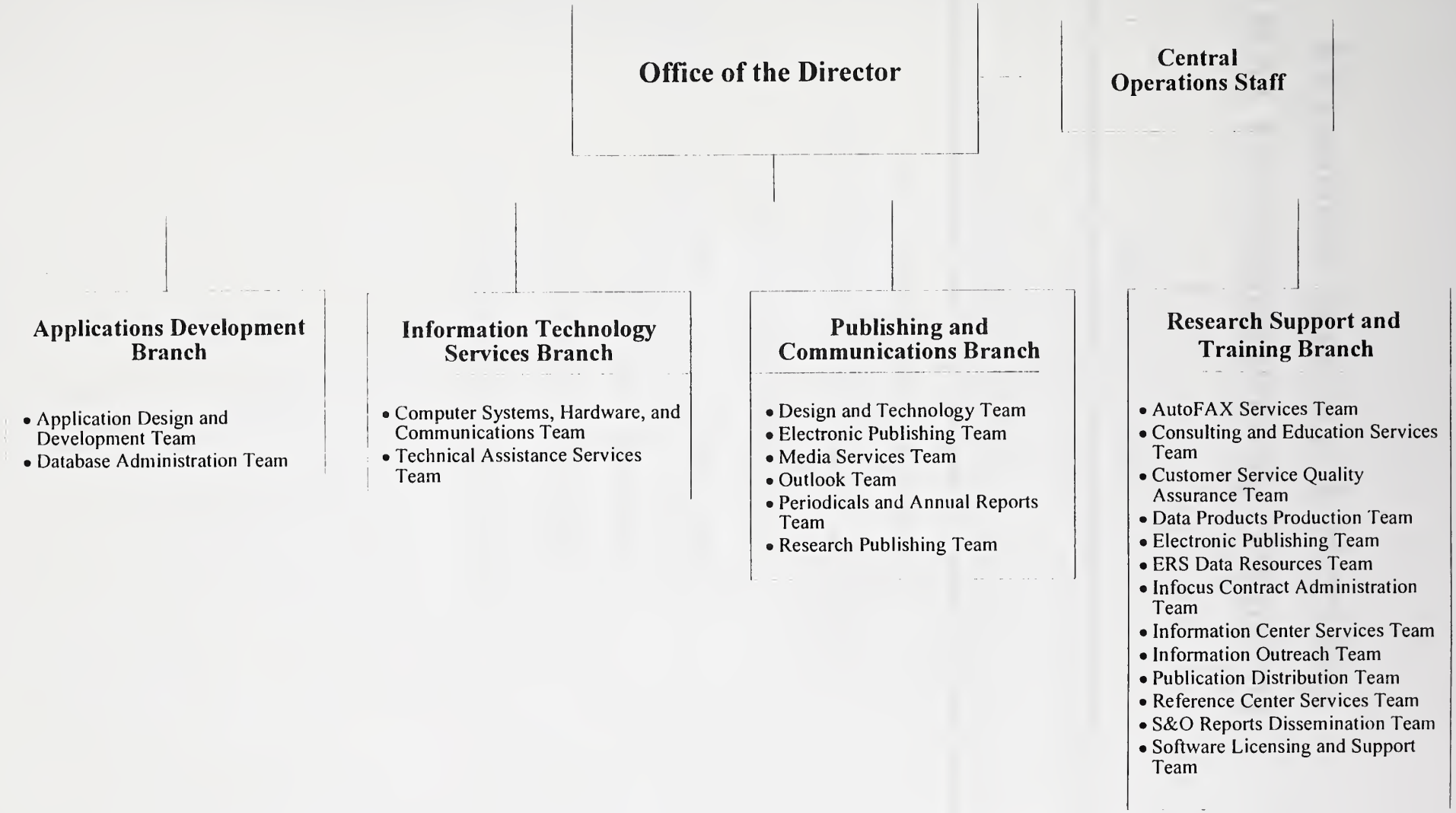
Economic Research Service



May 14, 1996

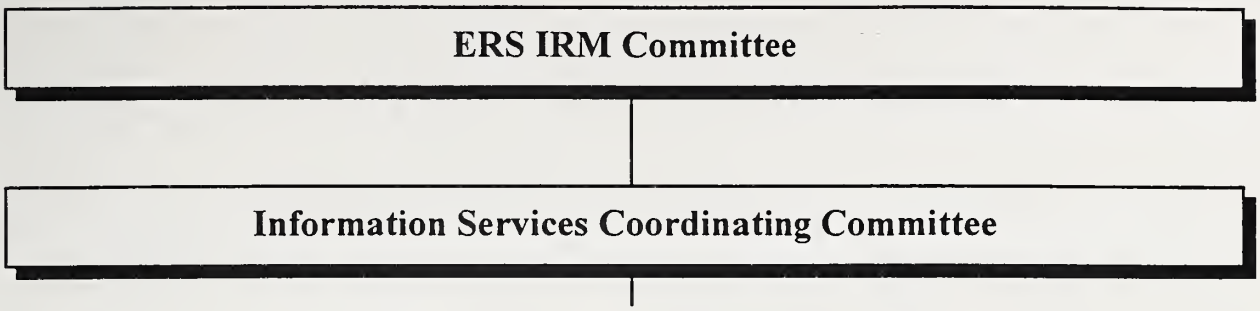
Information Services Division

Branches and Teams



May 14, 1996

Economic Research Service
IRM Decisionmaking Structure



Administrative Systems Subcommittee

Agency Computing Environment Subcommittee

Data Coordinators Subcommittee

IRM Strategic Planning Subcommittee

Product Coordinators Subcommittee

Software Standards Subcommittee

Toolkit/Data Directory Subcommittee

CHAPTER V

National Agricultural Statistics Service (NASS)

A. AGENCY AND IRM PLAN OVERVIEW

1. INTRODUCTION AND BACKGROUND

The National Agricultural Statistics Service's (NASS) mission is to serve the United States, its agriculture, and its rural communities by providing meaningful, accurate, and objective statistical information and services. The Agency's largest program is its Agricultural Estimates Program. In its Statistical Research and Service Program, NASS conducts research designed to improve the statistical methods and techniques used to produce agricultural statistics. In addition, NASS performs reimbursable survey work for other Federal, State, and producer organizations.

Statistical data developed by NASS on the Nation's agriculture are essential for the orderly development of production and marketing decisions by farmers, ranchers, and other agribusinesses. These agricultural data series are also used for monitoring the ever-changing agricultural sector and for making and carrying out agricultural policy relating to farm program legislation, commodity programs, agricultural research, rural development , and related activities.

The key mission-oriented program of NASS is the collection, summarization, and analyses of data, and the publication of accurate and reliable agricultural forecasts and estimates. Thousands of farmers, ranchers, agribusinesses, and others voluntarily respond to nationwide surveys about crops, livestock, prices, and other agricultural activities. These surveys are supplemented by field observations, objective yield counts and measurements, and other administrative data to provide reliable information. Annually, estimates for about 120 crops and 45 livestock items are published in approximately 400 reports prepared by NASS's Agricultural Statistics Board (ASB).
The agricultural production and marketing data developed and published by NASS include: number of farms and land in farms; acreage, yield, and production of grains, hay, oilseeds, cotton, tobacco, some fruits and vegetables, floriculture, and other specialty crops; stocks of grains; inventories and production of hogs, cattle, sheep and wool, goats, catfish, trout, poultry, eggs, and dairy products; prices received by farmers; prices paid by farmers for inputs and services; cold storage stocks; agricultural labor and wage rates; agricultural chemical use; and other data related to the agricultural economy.

The NASS agricultural statistics program is conducted through 45 State Statistical Offices (SSO's) servicing all 50 States. These SSO's are operated under cooperative funding arrangements with State Departments of Agriculture and/or land-Grant universities. This arrangement efficiently

serves the agricultural data needs at both the State and Federal levels and eliminates duplication of effort. These beneficial agreements provide increased service and additional agricultural data for State and local needs while minimizing overall costs to the Federal Government. Twenty-three NASS State offices are physically located in State office buildings.

The multiple (list and area) sample frame methodology, developed jointly by NASS and Iowa State University, is the most complex part of the process and is the primary factor contributing to the accuracy of the forecasts and estimates. The area frame is essentially the land mass of the entire United States. This land mass has been mapped several different ways: street and road maps, administrative maps, soil survey maps, and geological survey topography maps. In addition, high altitude aerial photographs and satellite imagery provide useful information about the land. Through a process called digitizing, many of these map products are translated into a digital format which allows them to be stored in computer media. Using a process called computer assisted stratification, the satellite and other land use data are used to classify all of the land in each State by the intensity of cultivation. These land use classifications range from intensely cultivated areas to marginally cultivated grazing areas to urban areas. The land in each use category is then divided into segments which have differing sizes by classification strata; ranging from very large segments in Western non-agricultural areas, to 1.0 square miles in cultivated areas, and 0.1 square miles in urban areas.

The NASS List Frame contains the names, addresses, and certain characteristics about every farm or agribusiness known to the Agency. Currently, the List Frame contains over 3 million records. Even though theoretically the List Frame can never be complete, because of constant changes to an operation, it does provide several sampling efficiency advantages over the area frame. For items grown on a small percentage of the farms, the List Frame is the only effective sampling frame upon which to base national estimates. If the List Frame of farm operators contains information on relative size, extremely large operations can be selected with the highest degree of probability to minimize their impact from sampling variability.

As an example of how these frames are used, the June Survey is the largest of the several hundred surveys conducted by NASS. Between the frames, a total of about 125,000 farm operations are interviewed during the first 2 weeks in June. Multiple frame sampling ensures that all land, livestock, stocks, etc., in the U.S. have a chance to be accounted for once and only once. By the end of June NASS will have published estimates of crop acreages, stocks of grain in storage, and Hog inventories.

The NASS also conducts surveys on a reimbursable basis for other Federal, State, and private agencies or organizations. NASS's existing survey capability provides these services much more

efficiently than having each agency conduct its own surveys. In addition, technical assistance for the development of agricultural statistics programs in foreign nations is conducted on a reimbursable basis.

The NASS survey research program improves both statistical methods and the utilization of advanced technology in the timely and cost efficient production of quality agricultural statistics. Methodology research improves sampling, yield forecasting, survey, and estimation techniques. Technology research investigates the potential of advanced techniques such as computer assisted data collection and processing, non-mainframe-based record linkage algorithms, geographic information systems, and remote sensing image processing to improve the nation's agricultural statistics program.

All NASS offices are linked to a common teleprocessing network where very large data files are generated and processed quickly. Data from large-scale surveys are edited over the network with procedures and files established centrally. Other surveys are edited and summarized using parameters supplied by the SSO's into generalized systems established by the Agency. SSO's also use the teleprocessing network to transmit survey indications and recommended estimates to headquarters. Some survey recommendations are handled under special security procedures because of the sensitivity of the data and their potential impact on the cash and futures market prices of the commodities involved.

NASS implemented a restructure of its Headquarters, located in Washington, D.C., effective March 1995. The organizational chart, attached as Attachment A, indicates the major division of responsibilities within the Agency. The Systems and Information Division (SID) provides major information systems support. The Division includes three Branches; the Systems Services Branch, the Technical Services Branch, and the Information Services Branch. The Division is comprised of approximately 80 employees. A copy of the SID organizational chart is included as Attachment B. SID is responsible for NASS's information management system and processing services. Specific functions of the Division are:

A. Design, maintain, and provide appropriate access to an integrated and standardized information management system containing sampling frames, survey data, estimates, and administrative records utilized by the Service.

B. Design, test, implement, and maintain application systems within the information management system.

C. Provide support for users of the information management system through

documentation, evaluation, training, and resolution of information management problems.

D. Distribute all reports releasing official State and national estimates and forecasts from the Service.

E. Coordinate data communications, data processing, and office automation activities in support of the agricultural statistics program.

F. Provide centralized facilities for selected data processing operations.

G. Collaborate with the Research Division (RD) on planning and conducting research projects involving new computer hardware, software, processing advancements, and other data management considerations.

H. Participate with senior management in planning and carrying out special studies and programs to appraise and strengthen data management standards of the Service.

I. Conduct studies and develop improved data base management, application systems, and data processing methodology.

J. Prepare reports, plans, and reviews required by the Department, OMB, and Congress relative to IRM and serve as the Service technical contact on IRM issues.

NASS management has created an IRM Review Board as a subcommittee of the Strategic Planning Committee to prioritize all system development, compile and approve the Long-Range Information Resource Management Plan, and oversee the utilization of resources. The Board is chaired by the Senior IRM Officer (SIRMO) for NASS, the Systems and Information Division Director. Membership includes senior representatives from all NASS divisions plus two Field Office representatives. The SIRMO is responsible for the review and approval of all major ADP acquisitions. This assures that ADP purchases conform to the goals, objectives, and strategies established in the Agency Long-Range IRM Plan.

The Agency has a staff of about 1,150 full-time Federal and State employees, one-fourth at Headquarters and three-fourths in the field. Approximately 250 of the employees are involved in information processing as technical specialists, data administrators, programmer analysts, LAN

administrators, and managers. They are located throughout the Agency, in each division. A primary and backup LAN administrator is located in every Field Office, and in each branch in headquarters. As previously indicated, IRM issues are coordinated through the Systems and Information Division.

Development of major processing systems for the Agency is performed through special Agency work teams. Systems such as those used for Headquarters processing of major reports are prepared in Headquarters to specifications drawn up by the Estimates Division. SSO's do varying amounts of systems development depending upon their State responsibilities and their staffing levels. Many new State survey projects can be totally handled by commodity statisticians through coding parameters for existing generalized routines.

In addition to the data processing approaches used for operational NASS surveys, extensive development efforts have gone into processing procedures for utilization of spatially referenced information. This work is concentrated in the Research Division. Remotely sensed and other geo-referenced data are analyzed via image processing and geographic information systems (GIS) technology to study their use for crop acreage estimation, crop condition assessment, and graphical presentation of survey estimates.

Spatial research areas include the development of an expert systems approach for moving remote sensing analysis to Field Offices, investigating applications for PC-based GIS packages for Field Office LAN's integration of GIS and satellite image processing for color map products, and crop specific digital data layers.

Operational benefits to date include:

1) The operational area frame sampling methodology which has benefited most directly from the spatial analysis research; the Computer Assisted Stratification System (CASS), currently used by the Area Frame Section, was developed directly from previous remote sensing research efforts.

2) Survey data collected from area frame segments is combined with satellite remote sensing data to study improved crop acreage estimation in the Mississippi River Delta Region at the state and county level.

3) Satellite-based vegetation indices have been used by the Agricultural Statistics Board to assess large area crop conditions such as those which occurred during the 1993 Midwest flooding, the bumper crop year in 1994, and the current 1996 drought in the Southwestern plains. Research continues into using these indices to generate crop yield estimates.

2. IRM PLANNING PROCESS

The formal IRM planning process begins with annual meetings called by the Systems and Information Division's Director. Each participant is asked to review the Agency's IRM goals, objectives, and milestones. These individuals are uniquely qualified to assist with the development of the Long-Range Plan. In their combined rolls of development, maintenance, support, and administration of hardware and software systems which support the NASS Estimates Program, they are in constant contact with other NASS divisions involved in the collection, summarization, analyses and publication of agricultural forecasts and estimates. They are also present at conferences with representatives of other agencies within the Department when the requirements for interagency initiatives are being developed.

The result of these meetings, the proposed IRM Long-Range Plan, is then presented to the IRM Review Board. The Board reviews the plan and suggests modifications. Agency acceptance of the plan is dependent on a majority vote from members of the Board.

The resource requirements and major acquisition projections documented in the Long-Range Plan are then reflected in the annual A-11 IRM/ITS reports on obligations for information technology systems and technology acquisition investment plans.

The planning assumptions used in the development of the Long-Range Plan are:

- The Census of Agriculture will be moved to NASS beginning in FY 1997.
- The primary mission of NASS will continue to be providing the official agricultural statistics required by U.S. code, USDA regulations, USDA policy planning needs, cooperative agreements, and private or public funding agreements.
- Timely and accurate forecasts of crop conditions and yields will continue to be the most important information provided by NASS.
- Research will be performed to improve both statistical methodology and technology for the collection, tabulation, and distribution of information.
- The entire agricultural community needs to be served in some capacity. This includes preparation of specialty and/or rare commodity estimates.
- There will be more emphasis on reducing the data collection burden on farmers,

agribusinesses, and the general public.

- o There will be increased need for local area data such as county estimates.
- o The demand for reliable and timely estimates will increase.
- o Increases will occur in data processing costs, the use of consultants, and training requirements.
- o The IRM plan will grow and change.

Basic IRM policies used in the development of the Long-Range Plan are:

- o Centralized coordination of ADP activities, including procurement.
- o Agency ownership of data rather than individual unit ownership.
- o Standard data handling procedures (edit, summary, imputation, and analysis).
- o Unified Agency-wide data management system.
- o Standardized computer and communication technology throughout the Agency.

3. CURRENT IRM ENVIRONMENT

NASS has consolidated almost all major information systems support into one Division, the Systems and Information Division (SID). This Division is responsible for management of the information and processing systems. Specifically the Division designs, maintains, and provides appropriate access to integrated and standardized systems. The Division tests, implements and maintains almost all applications systems within the Agency. Contracts are used for some software development. The Division also develops specifications and monitors contracts for specialized technology assistance. SID provides end-user support for all users in Headquarters and the field.

In addition to the SID function, the field Division maintains a small technical staff in each Field Office and a Field Services Section (7 people) attached to the Colorado Field Office. This staff provides additional local technical support to the Field Offices.

Local Area Networks (LAN's)

NASS'S main Headquarters is located in the South Agriculture Building. Each of the approximately 250 Headquarters employees has access to a Windows based 486 or higher workstation connected to a series of Novell NetWare 4.1 production servers.

Forty three NASS Field Offices have LAN's with Novell NetWare 4.1. The size of the staff in these offices varies from 5 to 58 employees, and has a standardized LAN configuration. Each LAN has two file servers. The primary server provides ongoing file services while the other is held in reserve. A tower box containing six 1-gigabyte drives has been configured as one RAID5 composite drive. The disks are controlled by a disk subsystem array (DSA) controller and with the RAID configuration, which provides five gigabytes of data storage to the system.

In addition to the production servers, NASS utilizes a prototype and BETA server for both the Headquarter's and State Statistical Offices' LAN environments. All new hardware and software are first tested on the prototype server, migrated to the BETA server for full integration testing, and then migrated to the production servers.

NASS has a unique LAN configuration in its satellite office in Fairfax, Virginia. This satellite office houses the Research Division, which is a major user of image processing and geographic information system technology. Several platforms, each with very specialized hardware and software systems, are connected via four integrated 10BaseT Ethernet segments in this office. In addition to a NOVELL file server and related workstations maintained for compatibility with

operational NASS units, there is a second NOVELL file server, two SUN servers, two Windows NT servers, and a MicroVAX 3500 batch-process server. The SUN servers communicate via TCP/IP and NFS, and are used to support three areas: to connect and serve Hewlett Packard graphic workstations for area frame construction and analysis functions; to support several UNIX-based software packages, such as SAS, SYBASE, ERDAS Imagine, and ARC/INFO; and as file and system services for SUN workstations. The VAX-based system uses DECNET and TCP/IP to connect the MicroVAX (with 4 additional high-speed processor boards), a VAXstation 3100 graphic workstation, and high resolution graphic PC workstations. The MicroVAX is used for intensive analysis programs using very large (300 megabyte and larger) data files. The second NOVELL file server is used for specialized software not found in operational units. The Windows NT servers are used for moving GIS functions from UNIX-based systems used in area frame design to a generic hardware platform because of the cost of maintaining the UNIX hardware. All systems in this location can communicate with each other and share common resources (i.e. printers). A dedicated T-1 circuit links the Headquarters network and the Fairfax network through Cisco Routers, allowing access to all systems from either location.

Telecommunications

All NASS LAN's have an FTS2000 circuit for Wide Area Network (WAN) communications. Presently, the WAN solution employs X.25 at 9600 baud. All LAN's have Standard Network Architecture (SNA) gateways to provide 3270 SNA connectivity to outside mainframes. These same gateways also support remote job entry activities. In addition, a Simple Mail Transfer Protocol (SMTP) gateway provides links between NASS E-mail and Internet E-mail throughout the world. The NASS HQ LAN has a fiber link to the Departmental LAN which provides Department-wide access to other Internet services.

The NASS WAN is being implemented to facilitate client/server processes, to better accommodate 3270 and RJE activities, file transfers, centralized support, network management, imaging, and video conferencing. Dedicated T-1 circuits are used to form a backbone with five hubs to service the non-hub States in a region. In May 1996, nine circuits will be installed. They will join the three States connected in FY 1995.

Mainframe Services

Lockheed-Martin provides mainframe processing services required by NASS. The mainframe is an IBM 3090 class machine running the MVS/ESA operating system. The full range of services are provided, including backups, off-site storage and disaster recovery. Major software systems include CICS, TSO, JES, COBOL, SAS, ADABAS/Natural and Easytrieve.

NASS employees manage the execution of large and sophisticated information processing systems remotely from their offices. This provides the functional equivalent of a mainframe computer in each office. Application software can be either centrally developed and supported, or developed, installed, and operated from the Field Office.

Client/Server Systems

NASS has installed UNIX systems (IBM RS6000 and SUN Sparc Stations) as data servers within the client/server environment. These systems are primarily used for SYBASE databases and SAS. Databases are being implemented using SYBASE System 10. Current databases include Pesticide Use, a 3-State implementation of ELMO, and FSA producer data. Development and Beta environments have also been implemented.

NASS Data Architecture

NASS subscribes to the philosophy that data are a corporate resource and do not belong to any specific individual organizational unit. This concept forms the foundation for the current and planned data architecture in NASS. To have the most useful information resource, an architecture composed of various types of data bases have been and will need to be constructed in the future. Regardless of the delivery platform, the data bases are classified as data warehouses, functional, and legal value reference tables. NASS's goal in the construction of these data bases is to have them under a central control in a distributed client/server relational data base environment. The legal value reference tables data bases generally contain data which are common to most functional applications throughout the Agency.

Information Data Bases (Data Warehouses)

These corporate-wide data bases are the most important of all the data bases created by the Agency with the most potential clients and possible uses. The NASS data warehouse concept is based on the fact that NASS considers its data to have major informational value and should be available in an easily accessible media. By creating informational data bases NASS will be providing all users within, and in some cases outside NASS, with the ability to locate and access sharable data for handling unforeseen information needs. Some specific uses may be identified but, in general, most future uses are unknown. In today's rapidly changing world it's virtually impossible to anticipate all of the uses that a data bank might have. Once the users are exposed to the contents and access tools, they will develop new ideas on how the data can be analyzed, used, or put together in reports. Examples of major information data bases currently visualized for NASS are the List Sampling Frame, Estimates and Indications, Published Estimates, Historical Survey data base, etc.

Application Data Bases

From these data warehouses NASS users can extract a fraction of the data base tables to be used to drive specific functions. They may be used independently or in conjunction with other data warehouses to meet these requirements. Normally when the function is successfully complete, these application data bases would be used to update the data warehouses and then be discarded. In some cases they may be retained for future uses. Examples of this type of "throw away" data base are single commodity files created by the commodity staff used in developing State and national estimates.

Legal Value Reference Tables

The third type of data base contains common meta data at the Agency level. These data are used in conjunction with the data warehouse and functional data bases to solve specific problems or to display information. These meta data bases contain generic data elements that are not direct program elements but are used to identify program elements, etc. Examples of these types of data bases are the FIP's code data bases for county names, item codes, and commodity codes, etc. These data bases are structured and maintained centrally but are made available to every NASS end user for the development of their own program delivery modules.

These three types of data bases constitute the NASS corporate data base model. Except for the application data bases, the model is centrally managed. NASS has been committed to this data management philosophy for several years, and substantial progress has been made.

Use of Computer Assisted Survey Information Collection (CASIC)

Computer Assisted Survey Information Collection refers to computerized methods to collect and edit data such as computer assisted telephone interviewing (CATI), computer assisted personal interviewing (CAPI), and interactive editing (IE). The installation of the LAN's in the SSO's has made CASIC technology available to all of them.

Automated instruments provide a more efficient, error-free computerized questionnaire than the traditional paper questionnaire. These instruments bring up each question on the computer screen in proper sequence and skips the interviewer to the next appropriate question after a response has been entered, thereby ensuring that the correct questions are asked. Instantaneous edits of the data are performed which allows the interviewer to clarify any erroneous or unusual answers with the respondent, and data from previous surveys can be brought into the interview or editing process to obtain higher quality data. By integrating editing and data entry with the data collection, many traditional post-interview activities such as data entry, data editing, callbacks to resolve data problems and questionnaire filing, can be eliminated or minimized.

Data collection applications have been programmed using either CASES software from the University of California at Berkeley or the Blaise software from Statistics Netherlands. Blaise is now the software of choice, because of its popularity with interviewers and it provides the extra benefits of interactive editing. Thus all future CASIC instruments will be written in Blaise.

CATI refers to data collection by telephone from the SSO. The CATI management software automates many functions including form delivery to the interviewer, tracking appointments and

maintaining administrative information relating to interviewer performance. For small samples the SSO may choose to use other types of form delivery including a point and shoot method or manual delivery using "call sheets."

CAPI is an alternative to paper questionnaires when conducting personal or face-to-face interviews, or when field enumerators conduct telephone interviews from their home. The interviewer uses an automated instrument on a laptop computer rather than a paper questionnaire. Pilot studies on the 1993 and 1994 June Agricultural Survey in Indiana showed great promise. An automated method of transferring instruments, assignments and data between the SSO and the laptops using telecommunications was successfully demonstrated. In 1995, all 27 field interviewers in Indiana used laptop computers to collect about 1,500 farm interviews for the June Area Survey. The data were successfully collected; however, some problems with both hardware and software occurred during the survey, negating some of the expected gains in efficiency. Hardware costs for sub-notebook computers have unexpectedly increased. At this time, there are no immediate plans to expand the project. However, the plan is to continue supporting the CAPI effort in Indiana, in the hope that costs decrease. Currently, field enumerators can collect their assignments electronically for six surveys, but the number is increasing as additional surveys utilize computer assisted technology.

IE provides a LAN-based post interview "micro level" edit. The editor reviews each record on screen and makes corrections as needed. The status of the form is immediately updated allowing the user to continue editing the form or store it if it is accurate. IE has been shown to reduce overall editing time and will allow us to reduce and eventually eliminate the current mainframe batch edits. Once data is clean on the LAN, other post-data collection processes such as analysis, imputation and summary could also be run on the LAN, instead of the mainframe.

Research will continue in other CASIC areas. Computer assisted self-administered questionnaires, for large farms and agribusinesses, will be the next technology evaluated.

4. ACCOMPLISHMENTS

NASS's continued ability to meet the Agricultural Estimates Program requirements is based largely on its accomplishments in the use of various computer based information processing platforms. Listed below are some of the more significant NASS IRM accomplishments.

A. Standard Technology Architecture

NASS recognized the need to standardize hardware and software technology to ensure resources expended on application systems are invested consistent with cost-effective information sharing, and the resulting systems have a long useful life. To accomplish that, it was necessary to define a Standard for Processing Technology (SPT) encompassing fundamental data processing and communications systems. The SPT includes contract processing facilities, such as a network processing center, as well as locally owned or managed components such as terminals, microcomputers, and minicomputers. The components of the SPT are intended to facilitate integrated systems and information sharing within NASS.

The basic purpose of the SPT is to control the number of information processing technologies to a reasonably functional subset of those available in the market place. It significantly improves data and information sharing through better integration and avoidance of incompatible hardware and software. It also controls the number of technologies needing support.

Individual organizational units may augment the SPT when local needs and design considerations indicate this is desirable and cost-effective. Augmentation of the SPT recognizes that SPT may not, at any given time, provide all needed functionality. The mission of some units requires additional technologies, such as remote sensing and geographic information systems.

Managers in NASS are responsible for assuring that SPT is adhered to in their respective units. The Director of the SID assures that all major acquisitions either adhere to the SPT or are exempted. SPT components are reviewed and updated by the IRM Review Board at least annually.

B . Local Area Network Upgrades

NASS has installed LAN's in all Field Offices and in its Washington Headquarters. These LAN's support standardized application software and provide extensive file sharing capabilities. These LAN's have been successfully upgraded from DOS-based client workstations to a Windows environment. The server software has also been upgraded to Novell NetWare 4.1 for all LAN's via the NASS initiated Novell Master License Agreement for USDA.

NASS has implemented a SMTP link between our internal E-mail system, cc:Mail, and

the Internet. Each NASS employee has an Internet E-mail ID.

C. Administrative Systems

During FY 1995 NASS replaced its entire financial accounting system. The NASS Control Register was replaced with the NFC Funds Control System and the NASS Administrative Records System was replaced with the NASS-developed Time and Attendance System (T&A). The T&A system is a windows-based application with which all NASS employees account, by project, for their working hours. It consolidates payroll processing for Federal employees and replaces the NFC Personal Computer Time and Attendance Remote Entry System (PC-TARE). Every NASS staff member with administrative processing responsibilities is now connected to the NFC Central Accounting Database Inquiry System (CADI) through 3270 gateways.

NASS has some unique administrative processing requirements related to State cooperative agreements. Several State offices maintain and monitor a State budget and keep track of salaries for the State employees working in that office. In addition, NASS employs a contract with the National Association of State Departments of Agriculture (NASDA) for survey enumerators. Each office has a local LAN system to process the biweekly travel and time and attendance for the NASDA enumerators. The totals from this system are sent to a private contractor for issuance of payroll checks to the enumerators.

Most of the other NASS Federal administrative processing is provided by the Administrative and Financial Management Division (AFM) within the ARS in a co-servicing arrangement. All personnel and accounting system processing performed at NFC is currently done in 3270 mode by AFM-ARS employees.

D. Data Sharing in USDA

NASS is aggressive in initiating data sharing activities with other agencies in the Department. Specific accomplishments in this area included: (1) development of procedures to provide NASS with unrestricted direct access to FSA producer names, acreage, and wool data (2) establishment of Liaison positions between the two agencies to facilitate data sharing activities; (3) development of new procedures to gain efficiencies and reduce the cost of FSA data received by NASS; (4) implementation of procedures to allow FSA, APHIS, AMS, and ERS staff direct access to the NASS Published Estimates Data Base.

The new procedures developed to directly access and process CFSA data on a local minicomputer will save out-of-pocket processing costs over the next 5 years. Additional cost savings associated with list building should be realized by better identification of active farm operators contained in the CFSA administrative lists.

E. Electronic Information Dissemination to the Public

NASS is a major participant in the Departmental efforts to expand the use of electronic dissemination of information to the public. Reports issued by NASS are available to data users through Internet and USDA's Computerized Information Delivery (CID) contract. Historic data files are available on the Internet and are also available to data users in the form of diskettes. Some of NASS' major reports are also available over the ERS/NASS Bulletin Board. The *Agricultural Statistics* book is available on CD-ROM and Internet. Numerous graphic files are also on Internet with links to the relevant NASS report. In addition, the media room was renovated for reporters. Early access to reports was allowed in the NASS lockup area and the information was provided to the reporters on diskette and hardcopy. Procedures were implemented whereby the reporters could prepare their reports and then not be allowed to transmit until the official designated time.

F. Pesticide Data Program - Analysis and Summary

The Pesticide Data Program and Environmental Surveys were processed using the Analysis and Summary System. NASS developed higher quality analysis procedures beyond the scope of NASS' existing Enumerative Survey Summary System. Some modules of the new system were used to summarize these surveys. The modular design of the new Summary System allows for changes in methodology with minor impact to parameters and little to no impact to the system.

G. Computer Assisted Stratification and Sampling

A system for Computer Assisted Stratification and Sampling (CASS) was developed for use in constructing and maintaining area sampling frames. The system uses satellite imagery and digital line graph data for area sampling frame construction, allowing the final product to interface with other GIS information. To date, six State area sampling frames have been constructed using this system. The original development of this system

took advantage of the state of the art technology at the time. This involved the use of high- end graphic workstations and machine dependent proprietary software, developed in conjunction with NASA Ames Research Center. Presently the Area Frame Section is implementing a Commercial-Off-the-Shelf (COTS) solution that will enable the system to be portable across many hardware platforms. ARCINFO and ARCView will combine to allow vector digitization and GIS connectivity. Image processing software packages like ERDAS Imagine, PCI Remote Sensing, and others are being evaluated. Thus, the Agency will have more flexibility in choosing new hardware platforms and allowing other users access to the system.

H. CATI Implementation

Computer Assisted Telephone Interviewing (CATI) is available in 42 Field Offices (all except Alaska and Hawaii). The state offices have approximately 600 workstations that are used for CATI. During 1995, NASS began to convert production CATI applications to Blaise III. As of May 1996, 25 offices are using Blaise for the following survey applications: Crops/Stocks, Hog, Cattle, Sheep, and Cattle on Feed. CASES is still used in 17 States on Crops/Stocks and Hogs. All States still use CASES on these applications: Labor, Agricultural Yield, and Milk Production. Blaise 2 is used for Catfish, Trout, Cotton Ginnings, and Chicken and Eggs. Plans call for all Field Offices and the remaining applications (CASES and Blaise 2) to convert to Blaise III by early 1997. The Field Offices have used CASES, Blaise 2, and Blaise III on a variety of applications including, Crop Weather and County Estimates.

I. Interactive Editing Implementation

Blaise interactive editing (IE) is available on all applications for which a Blaise CATI instrument exists. Blaise IE has replaced the SPS edit for Cattle on Feed and plans are to phase out the SPS edit for Hogs, Cattle and Sheep during the next year. There is no SPS edit for the Blaise 2 applications.

5. FUTURE DIRECTION

NASS is exploring the use of Computer Assisted Personal Interviewing (CAPI) using laptop microcomputers as direct data collection devices outside of the office environment. They will be used by enumerators to record objective yield counts, data from personal interviews, and other field observations, and to record enumeration costs. These devices are known to have the capability to identify potential errors in recording at the time of the field visit. Any errors can be

corrected on the spot rather than days later when detected in the office.

NASS is upgrading its Wide Area Network (WAN) to meet demands of client/server computing, file transfers, new image processing expectations, and video teleconferencing. An upgraded network will provide the communications necessary for better Headquarters technical support of the Field Offices. NASS also expects to research the use of video teleconferencing.

Several SSO's have experimented with collecting survey data through the Internet. Current testing has been limited to data collection for weekly Crop Progress and Condition reports. NASS is very interested in pursuing electronic data collection for this report because of the timeliness of the data involved. Reports are published on Monday afternoons, reflecting crop conditions and progress for the week ending Sunday. This survey is also a good candidate for electronic data collection because most of the respondents are County Extension Agents who have Internet access, and the data being transmitted are not confidential or personal.

Nass plans to move aggressively toward a virtual workplace. A pilot study in telecommuting is now underway. More significant achievements are anticipated with the installation of the WAN and with the maturing of video conferencing. Eventually the Agency expects to be able to use teams of staff from across the organization to tackle specific initiatives. These teams will operate as though they are in one location through the use of video teleconferencing.

Other anticipated uses of this technology include staff meetings, virtual Agricultural Statistics Board meetings and remote training. NASS conducts extensive in-house program and technology training each year. With the full implementation of remote training, made possible through video conferencing, NASS anticipates a major change in the way it conducts its own training program, reducing costs and improving critical staff utilization.

The size of the Agency program increased with the addition of the Pesticide Data Program and the Environmental Program. Although the basic program elements have remained the same, the way NASS fulfills its requirements has been changing. NASS is now moving toward a distributed client/server relational data base environment for its automation activities. Survey processing techniques will incorporate windows-based screen driven edit, analysis, and summary tools which will feed data warehouses. These data warehouses will be the repositories of key Agency program data. They will feed application systems and serve as the primary information source for future decision making. Major data warehouses include the list frame of farm operators, the warehouse of Estimates and Indications, the Published Estimates, and a data base of historic farm-level data

collected in previous NASS surveys. In addition to the program data, several data bases will be constructed to contain generic data used in the Agency's normal day-to-day business and its research activities. Other specific functional legacy systems are to be reengineered. These activities constitute a vision of the future called the "NASS Data System 2000."

Budgetary constraints will place greater emphasis on the use of technology in order to meet increased Agency program output. Implementation of distributed data base technology increases processing costs, but the resulting benefits make the investment worthwhile. Some specific benefits anticipated in the future are:

- o Reduced respondent paperwork burden
- o Reduced redundant data collection and retention
- o Improved quality of estimates
- o Improved accuracy and timeliness of reports and releases
- o Increased productivity of personnel
- o Improved access to timely enterprise information
- o Increased sharing of NASS data in electronic form
- o Reduced maintenance of software systems.

The benefits as outlined above will directly benefit users of the information provided by NASS.

NASS IRM Objectives

The NASS IRM Objectives are documented on subsequent pages of this document. Some objectives were changed last year but none were significantly modified or deleted this year. There are no new objectives. Status of NASS objectives include:

1. Objective Title: **Develop the NASS Data System 2000**

   Status: Objective title changes slightly but issue remains current.

2. Objective Title: **Equip the Staff**

   Status: Remains current.

3. Objective Title: **Enhance NASS Staff's Technical Capabilities**

   Status: Remains current.

4. Objective Title: **Enhance Telecommunications Capabilities**

   Status: Remains current.

5. Objective Title: **Enhance Data Accessability**

   Status: Objective title modified, but issue remains current.

6. Objective Title: **Research New Technologies**

   Status: Remains current.

1. Objective Title: **DEVELOP THE NASS DATA SYSTEM 2000**

2. Status:

   Continuing.

3. Objective Statement:

   Create relational client/server data bases and systems across multiple computer platforms, in a distributed fashion, for operational processing and data warehousing.

4. Strategy:

   Client/server data base management system technology will serve as the cornerstone of the data warehouse environment. Applications will be converted or developed, based on that technology, using additional software tools as necessary for data analysis, display, etc. Systems analysts will determine the best data storage location for specific applications, based on volume, access patterns, security requirements, etc. Individual users, however, will view the data from all applications as a whole, without being concerned about where any particular piece resides. The first major application to be ported to this platform is the Enhanced List Maintenance Operations (ELMO) system. NASS Estimates Database, Historical Data Database, and Published Estimates Data Base (PEDB) will contain the remainder of the NASS statistical data.

5. Program Supported:

   Agricultural Estimates Program
   Statistical Research and Service Program
   Census of Agriculture Program

   This objective also supports Initiative 1, and Goals 4, 5, and 6 of the NASS Strategic Plan.

6. Cross-Cutting or Interagency Program supported:

   Pesticide Data Program and the Environmental Program

7. Background:

NASS currently uses systems which are related but not necessarily interconnected. Users must deal with the issue of where data resides (e.g. on the mainframe or on a local PC) and how to get them from one platform to another.

8. Contact Name and Phone Number:

Mary Anne Cummins, Chief
Systems Services Branch
Systems and Information Division
720-7906

9. Major Milestones:

	Planned		Actual
	Start Date	End Date	End Date
ELMO Implementation	10/93	7/99	
Release System Camera Copy	6/93	8/95	3/95
Survey Management Systems	8/93	8/95	8/95
Processing of National Surveys	5/93	5/97	
-Interactive editing	5/93	9/97	
-Survey analysis tools	10/94	10/96	
-Survey summary tools	7/90	5/97	
Admin. Systems for Contract Enumerators			
-Payroll module	6/91	1/93	10/93
-Budget Request/ Allocation System	9/92	4/94	4/94
LAN SAS Summary System	8/93	8/95	3/95
Published Estimates Database (on Internet)	8/95	12/97	

Data Warehouse of Historical Reported Data	9/95	6/98
NASS Estimates Database (NEDS)	11/94	9/00
Mainframe Services recompetition	1/96	10/97
Process Census	1/97	01/99
ELMO II	9/95	7/01

10. Resources:

	Thru FY96	FY97	FY98	FY99	FY00	FY01	FY02+	TOTAL
Total Costs (000)	4,900	4,500	6,000	4,000	2,500	2,300	3,500	27,700
Staff Years	26	32	35	31	27	27	30	208

11. Acquisition Description:

The majority of the data base products will be acquired in FY'98 for installation in determined sites. Developmental and CASE tools will be acquired, as needed by NASS, to meet its growing developmental requests. Data base servers will be acquired as needed to maintain or improve performance.

Other software, such as Graphical User Interface tools, will be acquired, as needed, to assist users in running the systems or to make ad hoc queries will also be acquired as needed.

12. Departmental IRM Implementation Framework Area Supported:

Business/Customer Support
Information and Data Management
Application Information Systems
Delivery System

1. Objective Title: **EQUIP THE STAFF**

2. Status:

   Continuing.

3. Objective Statement:

   To provide every NASS employee with a full range of processing technologies to support data entry, on-line data base processing, data capture, word processing, desktop publishing, publication-quality graphics, spreadsheet applications, statistical data analysis, and access to batch processing through standardized, multipurpose workstations and peripherals.

4. Strategy:

   NASS has installed local area networks (LAN's) in the SSO's and Headquarters. Equipment will be updated as new technologies and software enhancements become available.

5. Program Supported:

   Agricultural Estimates Program
   Statistical Research and Service Program

   This objective also supports Goal #6, 7, and 9 of the NASS Strategic Plan

6. Cross-Cutting or Interagency Program supported:

   Pesticide Data Program and the Environmental Program

7. Background:

   NASS defined functional requirements for LAN hardware and software and issued an RFP to acquire LAN's for its State Statistical Offices and a Headquarters Support Office in 1989. The RFP resulted in an 8-year contract award to Sysorex Information Systems. Prior to this contract, the major hardware acquisitions in NASS offices had been for data entry equipment, RJE capability, and "stand-alone" personal computers. These devices did not easily share data within an office or with mainframe applications.

8. Contact Name and Phone Number:

Gary Zeller, Chief
Technical Services Branch
Systems and Information Division
690-2273

9. Major Milestones:

Milestone	Planned Start Date	Planned End Date	Actual End Date
LAN Technology Refreshment	6/95	9/02	
Novell NetWare 4.1 implementation	8/95	8/96	5/96
Client Software Upgrade	10/96	10/99	

	Thru FY96	FY97	FY98	FY99	FY00	FY01	FY02+	TOTAL
10. Resources:								
Total Costs (000)	15,700	4,000	4,000	2,500	2,500	2,500	3,000	27,700
Staff Years	55	15	15	10	10	10	10	115

11. Acquisition Description:

NASS plans to purchase hardware and software through new or existing government contracts. NASS may plan to recompete the Sysorex contract by the end of the existing contract.

12. Departmental IRM Implementation Framework Area Supported:

Business/Customer Support
Information and Data Management
Application Information Systems
Delivery System

1. Objective Title: **ENHANCE NASS STAFF'S TECHNICAL CAPABILITIES**

2. Status:

   Continuing.

3. Objective Statement:

   To maintain a highly competent staff knowledgeable in the application development tools used by the Agency and to keep the staff abreast of rapidly changing technologies.

4. Strategy:

   The NASS ADP training thrust is active on many levels ranging from individualized training in specialty areas to a widespread IRM training effort covering the entire NASS staff. Generally, the goal of training is to provide data processing personnel with the knowledge they need to meet individual and Agency requirements. Several in-house training sessions are conducted by the NASS staff, either on-site or in the Headquarters Training Facility in Washington, D.C. National ADP schools are held approximately every 1 1/2 years to keep the Field Office ADP staff abreast of the latest policies and procedural approaches to ADP in the Agency. NASS annually selects from one to three individuals to receive graduate level training in computer technology from colleges and universities across the country. These individuals are usually admitted to the Graduate School in either Computer or Information Sciences.

   With the installation of LAN's, NASS conducts extensive in-house training at each LAN location. These sessions are designed to teach the entire office staff the various IRM products selected for inclusion on the local area network. Training includes the use of word processing, spreadsheets, graphics, electronic mail, mainframe data base access, automated data collection, communications, and remote job entry. As additional applications are implemented, NASS will continue to train its staff in the use of these new applications.

   NASS makes use of automated training techniques through VCR and computer-based training courses. Several computer-based training courses are purchased and installed on all NASS LAN's. Additional courses will be purchased as they become available. Some in-house development of computer-based training courses will also occur. Courses are developed on processing systems and certain administrative support

functions. When the technology matures, NASS plans to utilize PC-based video conference technology, utilizing the NASS WAN. This technology will allow NASS employees to receive firsthand training right at their workstations.

5. Program Supported:

Agricultural Estimates Program
Statistical Research and Service Program

This objective also supports Initiative #3, and goals #7 and #9 of the NASS Strategic Plan

6. Cross-Cutting or Interagency Program supported:

Pesticide Data Program and the Environmental Program

7. Background:

The rapid changes in IRM technology makes maintaining a highly trained technical staff more difficult. NASS continually reviews and updates the various technology platforms used in the Agency, making an enhanced training effort necessary.

8. Contact Name and Phone Number:

Phillip L. Zellers
Director, Systems and Information Division
720-2013

9. Major Milestones:

	Planned		Actual
	Start Date	End Date	End Date
LAN Administrator Training	2/97	2/97	
1996 Systems Services Workshop	3/96	4/96	4/96
1997 National ADP School	10/97	10/97	

1999 Systems Services Workshop	3/99	3/99	

	Thru FY96	FY97	FY98	FY99	FY00	FY01	FY02+	TOTAL
10. Resources:								
Total Costs (000)	2,600	700	650	700	700	800	800	6,950
Staff Years	52	12	10	15	10	12	10	121

11. Acquisition Description:

None

12. Departmental IRM Implementation Framework Area Supported:

Information and Data Management
Program Management

1. Objective Title: **ENHANCE TELECOMMUNICATIONS CAPABILITIES**

2. Status:

   Continuing.

3. Objective Statement:

   To provide connectivity of interagency and intra agency facilities for voice and data transmissions through the use of FTS2000 services. This may include switched voice, packet switched service, and switched digital integrated services.

4. Strategy:

   To meet its future distributed processing intentions, NASS plans to install a high-speed data communications network connecting all NASS locations. This will provide the communications link required to transmit large volume files between locations. NASS plans to take advantage of the USDA Enterprise Network Services when it becomes available

5. Program Supported:

   Agricultural Estimates Program
   Statistical Research and Service Program

   This objective also supports Initiative #1 and Goal #6 of the NASS Strategic Plan

6. Cross-Cutting or Interagency Program supported:

   Pesticide Data Program and the Environmental Program

7. Background:

   In the past decade, NASS has utilized a combination of facilities and vendors to provide its telecommunications needs. Voice services were provided by the Federal Telephone System (FTS2000), local IN WATS services, or special State arrangements where these facilities were not available.

8. Contact Name and Phone Number:

Gary Zeller, Chief
Technical Services Branch
Systems and Information Division
690-2273

9. Major Milestones:

	Start Date	Planned End Date	Actual End Date
WAN technology upgrade	10/95	3/98	
WAN technology refreshment	10/97	9/02	
Video Teleconferencing	10/96	10/99	

10. Resources:

	Thru FY96	FY97	FY98	FY99	FY00	FY01	FY02+	TOTAL
Total Costs (000)	3,430	1,500	1,500	1,000	600	600	600	9,230
Staff Years	16	5	5	5	3	3	3	40

11. Acquisition Description:

Will buy T-1 circuits and high-speed routers from new or existing government contracts.

12. Departmental IRM Implementation Framework Area Supported:

Business/Customer Support
Information and Data Management
Delivery System

1. Objective Title: **ENHANCED DATA ACCESSIBILITY**

2. Status:

   Continuing.

3. Objective Statement:

   To enhance data users accessibility and usability of NASS data through the use of telecommunications, open systems technologies, and mass storage and retrieval systems. To use emerging technologies to make outside information sources more accessible and usable to NASS.

4. Strategy:

   NASS is investigating and implementing technologies and programs which provide more information in a timely and more user-friendly format. This includes, but is not limited to, the use of Internet, FAX On-Demand, CD-ROM, and other high-density storage technologies. NASS will continue to promote data sharing through cooperative efforts with other agencies and private industry. Examples of cooperation with other agencies include FSA, AMS, APHIS, WAOB, and ERS.

5. Program Supported:

   Agricultural Estimates Program
   Statistical Research and Service Program

   This objective also supports Initiative #4, and goals #2, 3, 4, 5 and 6 of the NASS Strategic Plan.

6. Cross Cutting or Interagency Program supported:

   Pesticide Data Program and the Environmental Program
   Ag Statistics Program

7. Background:

   Many technologies are already in place in NASS for the electronic exchange of data

with outside organizations. NASS has entered into a cooperative agreement with Cornell University to provide reports and data products over Internet which is available to data users at no charge. NASS is a major supplier of information to the Department's Computerized Information Delivery Service (CIDS) where data users can obtain the data at a fee to the vendor. In addition, new development is occurring on screen driven systems utilizing fully distributed data base technologies. Once information is placed in the data base structure, its potential for being shared and electronically exchanged with other agencies is enhanced significantly.

NASS developed and has an operational Home Page on the USDA Internet server. Also, a "standard" home page was created and is being tested by two SSO's. These files reside on the USDA Internet server. In addition, several of the State Statistical Offices have home pages through cooperative arrangements.

8. Contact Name and Phone Number:

Bill Pratt
Chief, Information Services Branch
Systems and Information Division
720-7017

9. Major Milestones:

	Start Date	Planned End Date	Actual End Date
Historical Published Estimates Data Base fully populated	8/89	12/97	
Test and operation of optical imaging storage and retrieval technologies	7/96	12/99	
Cornell Univ. Agreement Current estimates are loaded	10/94	9/97	
NASS Historical Published Estimates available on Internet	5/94	12/97	

News Media access to Electronic Reports	6/95	9/96	8/95
SSO Reports System Implemented	8/95	7/96	
Agricultural Statistics Books on CD-ROM	1/96	8/95	1/01

10. Resources:

	Thru FY96	FY97	FY98	FY99	FY00	FY01	FY02+	TOTAL
Total Costs (000)	600	1,000	2,000	1,000	400	400	500	5,900
Staff Years	6	3	2	2	2	2	2	19

11. Acquisition Description:

- Optical storage and retrieval devices
- Contract with Cornell University to provide reports and data products to data users over Internet.

12. Departmental IRM Implementation Framework Area Supported:

Business/Customer Support
Information and Data Management
Application Information Systems
Delivery System

1. Objective Title: **RESEARCH NEW TECHNOLOGIES**

2. Status:

   Continuing.

3. Objective Statement:

   Conduct research into applications of new technologies, directed to improving NASS operational procedures and programs by improving data quality, timeliness, and cost efficiency of agricultural statistics.

4. Strategy:

   NASS is actively seeking out, evaluating, and, when appropriate, applying the most promising and accessible technology advances, especially those which relate to information processing. Many of the potential applications involve initial proof-of-concept studies.

   Some major recent successes have moved to the operational program. Interactive editing, using a software package called Blaise from Statistics Netherlands, has moved from research to the operational program for several surveys. It has been implemented for the Aquaculture, Cotton Ginnings, Chicken and Egg surveys, quarterly Agricultural Surveys and Cattle on Feed surveys. The large-scale use of Blaise on the PC LAN's and elimination of mainframe edit processing for Federal surveys would lead to cost reduction. In addition, the SSO's have immediate feedback and control over the edit process timing instead of batch processing with time lags in determining if edit corrections are reasonable with other survey data. The State Statistical Offices have also been provided with Blaise to develop interactive editing instruments for State-specific surveys.

   An investigation is continuing into Computer Assisted Personal Interviewing (CAPI) as an alternative to the paper and pencil way of collecting data for some face-to-face interviews. CAPI has the potential of collecting data faster, cheaper, and with fewer errors by incorporating several technological factors into the data collection arena. Using software to control which questions should be asked insures that all necessary questions have answers while unnecessary questions are not included. Many data

discrepancies can be resolved immediately with the respondent during data collection. Since the data are being collected in a digital form, no rekeying is necessary, and the data can be transmitted electronically to the office using a modem. This reduces the time lag due to mailing and processing paper questionnaires. Pilot studies on the 1993 and 1994 June Area Survey in Indiana showed great promise. An automated method of transferring instruments, assignments, and data between the SSO and the laptops using telecommunications was successfully demonstrated. There are however some implementation issues to address. In 1995, all 27 field interviewers in Indiana used laptop computers to collect about 1,500 farm interviews for the June Area Survey. The data were successfully collected; however, some problems with both hardware and software occurred during the survey, negating some of the expected gains in efficiency. Hardware costs for sub-notebook computers have unexpectedly increased. At this time, the long term realized cost savings in the office cannot overcome the start-up hardware costs. Thus, there are no immediate plans to expand the project. However, the plan is to continue supporting the CAPI effort in Indiana, in the hope that costs decrease. Currently, field enumerators can collect their assignments electronically for six surveys, but the number is increasing as additional surveys utilize computer-assisted technology

Research staff are also keeping abreast of other methods of survey data transmission, such as use of FAX technology and optical scanners, voice recognition, and computer assisted self-interviewing, including the use of such technologies as the Energy Information Administration's PEDRO system and the Java programming language. Some of these methodologies would be pertinent for surveys of agribusinesses which are repeated on a regular basis. Others are more appropriate for longitudinal survey designs. The Agency's long range methodological plan will determine which technologies are most likely to be needed. Research will include a literature review of technologies being used by other agencies and businesses to facilitate respondents' willingness to respond to survey questionnaires. A small prototype may be developed once the methodology that appears most useful to NASS's applications has been identified.

As part of the Agency's effort to convert systems from a mainframe environment, researchers have evaluated "off-the-shelf" software to link duplicate name and address records from a database in a personal computer/local area network environment. Evaluation criteria for record linkage computer packages in both on-line and batch mode were developed. Several commercially available packages were evaluated, and the most promising package has been tested for flexibility in handling different types

of input lists and different list formats, multiple lists, and large lists. The package has also been used for special linkage projects, including reimbursable projects. Researchers will assist Systems and Information Division in implementing this package with ELMO, concentrating on the most "usual" record linkage applications first. These applications include within list duplication checking (now performed by Duplication Check), matching against the Farm Service Agency (FSA) list, and an overlap/nonoverlap checking tool. The migration of record linkage functions off the mainframe will reduce processing costs and potentially improve the quality of the list frame and associated multiple frame indications since duplication among and within list sources can be identified and resolved more quickly and on a more recurring basis.

Geographic Information Systems (GIS) methodology is used to store, access, manipulate, and analyze spatial data sets and their relationships. Agriculture related data inputs to a GIS include NASS county estimates, earth resources satellite data, soils maps, Census Tiger maps, USGS Digital Line Graph of transportation and hydrology networks, ground station weather data, and statistical samples from surveys which have been geographically referenced. Statistical samples might include area frame segments, farm chemical data, and agricultural production data. NASS is investigating both National and State Statistical Office applications of GIS technology including contour mapping and smoothing techniques. The Agency is investigating commercial PC-based GIS packages for SSO NOVELL LAN configurations.

Earth resources satellites with high resolution sensors collect large amounts of information which can be used to estimate crop acreages. Image processing and GIS methodologies can be combined to accomplish this task. Lowered processing costs and increased flexibility of these methodologies have aided the integration of data from new sensors and allowed new approaches and products. NASS has a unique advantage with its operational are frame sample to statistically measure accuracy of satellite assisted crop area estimates. County and sub-state estimates of crop acreage with measurable precision and color theme maps showing crop location are examples of products from this technology. This can also be used to create a digital, spatially referenced cropland data layer in major crops states for the National Spatial Data Infrastructure (NSDI). Preliminary work has begun on an expert system for satellite image processing which can be used in the SSO LAN environment to generate crops estimates and/or digital GIS inputs.

Both low and high resolution satellite sensors hold information on crop yield. NASS is currently investigating the application of biweekly low resolution data for graphical

display of general crop condition and as an input into specific crop yield models. The low resolution data has proven useful in monitoring widespread results of flood and drought conditions. A new low resolution weather satellite was launched in late 1994 to replace the aging one used in prior years. The new sensor data must be calibrated to earlier data to allow direct comparisons. Research on the use of multiple date acquisitions from high resolution sensor data is being conducted for direct yield estimation of spring wheat, rice and cotton. Comparison of data from the two resolutions will be performed to aid the yield analysis and the sensor calibration.

5. Program Supported:

Agricultural Estimates Program
Statistical Research and Services Program

This objective supports Initiatives 1,2 and 4, and Goals 4,5, and 6 of the NASS Strategic Plan.

6. Cross-Cutting or Interagency Programs supported:

USDA Remote Sensing Coordination Committee (RSCC)
USDA Weather and Climate Coordination Committee (WCCC)
USDA Agricultural Geographic Data Committee (AGDC)
USDA/ARS Remote Sensing Research Laboratory (Cooperative Agreement)
Federal Geographic Data Committee (FGDC) -- Subcommittee on Vegetation GIS Data Layer
Pesticide Data Program and the Environmental Program
Interagency CASIC Committee of Managers (ICCM)
Interagency CASIC Research Committee (ICRM)

7. Background:

New and advanced technologies such as aerospace remote sensing, expert statistical systems, geographic information systems, computer assisted data collection and editing, and interactive statistical and graphical data analysis offer great benefits to the NASS programs. The use of these technologies hinges on cost efficient hardware systems and user friendly application software systems.

8. Contact Names and Phone Numbers:

George Hanuschak
Chief, Survey Technology Branch
Research Division
703-235-5218 extension 105

9. Major Milestones:

	Planned		Actual
	Start Date	End Date	End Date
Interactive Editing			
Research	6/88	6/95	6/95
Assist with Implementation	6/93	10/96	
Computer Assisted Personal Interviewing (CAPI)			
Small Pilot	6/93	6/94	6/94
Large Pilot	4/95	10/02	
Geographic Information Systems Applications Development	6/92	10/95	
County Estimates Maps	6/94	4/96	4/96
Vegetative Index Maps	6/94	10/96	
Other Applications Under Development	6/95	4/97	
Remote Sensing Based Crop Acreage Estimates-Annual (ongoing)	Spring	Winter	Winter
Record Linkage Research			
Research	7/92	10/96	6/96
Assist with Implementation	4/96	12/96	

Computer Assisted Self Interviewing (CASI)			
Feasibility Research	6/96	6/97	
Small Pilot	3/97	12/98	
Large Pilot	9/98	9/99	

10. Resources:

	Thru FY96	FY97	FY98	FY99	FY00	FY01	FY02+	TOTAL
Total Costs (000)	7,450	1,400	1,300	1,300	1,200	1,200	1,100	14,950
Staff Years	65	16	15	15	14	14	13	152

11. Acquisition Description:

State-of-the-art subnotebook computers and associated systems for computer assisted personal interviewing pilot studies.

Maintenance cycle for analysis system workstations and high end desktops for intensive processing of remotely sensed data and geographic information system applications.

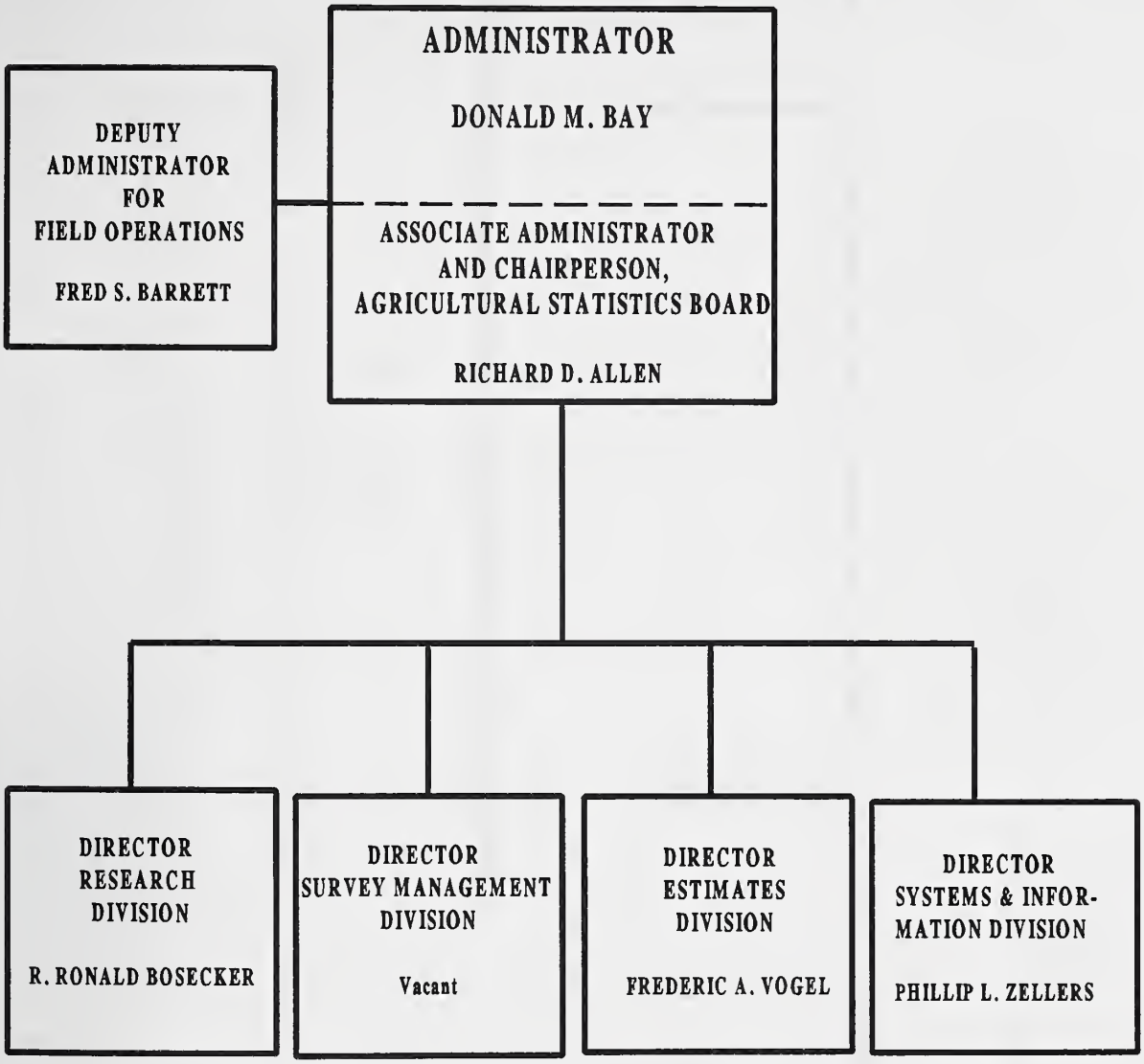
Other equipment for technology research, such as concept studies, yet to be determined.

12. Departmental IRM Implementation Framework Area Supported:

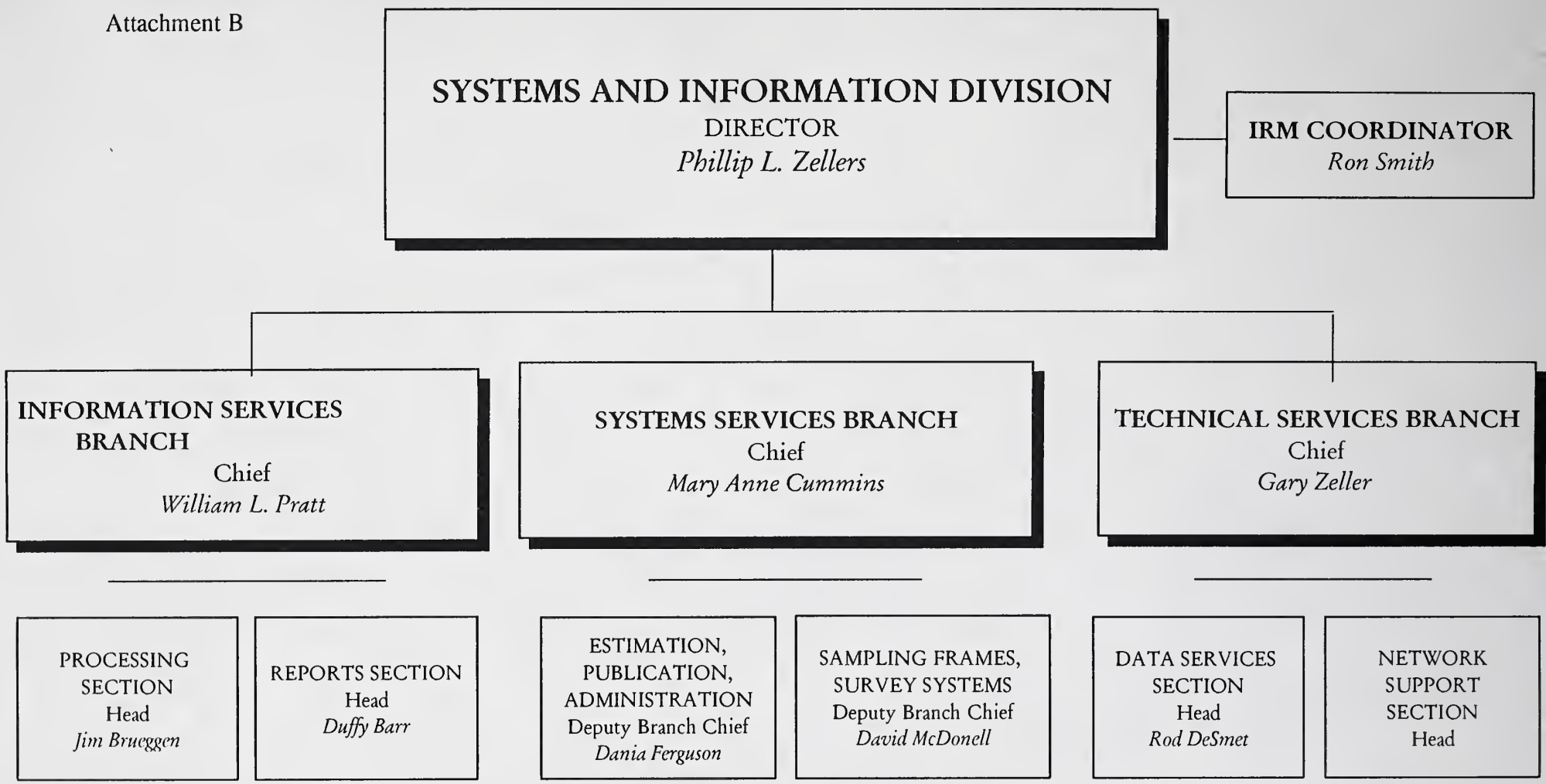
Business/Customer Support
Information and Data Management
Application Information Systems
Delivery System

Attachment A.

NASS ORGANIZATION STRUCTURE



Attachment B



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